MHS ROCKS AND MINERALS 2017 by Lauren Martin, Indiana University

Note from MHS coaches: This exam was initially created for Munster SO tryouts. Munster HS tryouts do not allow any reference materials regardless of event rules. They are taken by a single student in a 50-minute time period... scores are often low. Lauren Martin was the Indiana state champion for Rocks and Minerals in 2017. She wrote this as a volunteer. MHS is grateful for her talent and assistance.

_____________ / 120 points

Section 1: (1pt each)

Match each of the following minerals to its proper hardness on the Mohs scale.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Section 2: (1pt each)

Match each of the following minerals to the proper mineral class.

1. _____ copper
2. _____ gypsum
3. _____ fluorite
4. _____ azurite
5. _____ quartz

Section 3: (1pt each)

Identify each mineral class based on the description of its identifying characteristics (using the same box from section 2).

1. _____ Natural salts
2. _____ Base chemical formula SiO2
3. _____ Majority of the most economically important ores
4. _____ Pure chemical formula (only one element)
5. _____ Often in marine settings (with the accumulation of dead plankton)
Section 4: (1pt each)

Match each of the following habits to its proper description.

1. _____ “bubbly” or grape-like spheres
2. _____ flat and tablet-shaped
3. _____ thin, tapered, and needle-like
4. _____ eight-sided
5. _____ box-like
6. _____ branching or tree-like

Section 5: (2pts each)

Answer the following questions about the different groupings of rocks.

1. What does a foliated rock look like? ____________________________________________
   ____________________________________________
2. Briefly describe the process of foliation. ________________________________________
   ____________________________________________
3. How does an extrusive rock form? _____________________________________________
   ____________________________________________
4. What visible characteristic do most intrusive rocks share? _______________________
   ____________________________________________
5. What type of rock are you most likely to find fossils in and why? _________________
   ____________________________________________
6. What is the difference between felsic and mafic rocks? _________________________
   ____________________________________________
7. Will granite produce a chemical reaction when exposed to HCl? Why or why not?
   ____________________________________________
   ____________________________________________
8. How is a low-grade metamorphic rock different from a high-grade rock? __________
   ____________________________________________
Section 6: (2pts each)

Answer the following questions about similar rocks and minerals.

1. What is the difference between pumice and scoria? __________________________
   ______________________________________________________________________
   ______________________________________________________________________

2. How are azurite and malachite related? ________________________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

3. How can you tell the difference between halite and calcite? ________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

4. Why is it that quartz varieties differ so much in coloration? ________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

Section 7: (1pt each)

Define each of the following geological terms (each definition is only worth one point).

1. Specific gravity: __________________________
   ______________________________________________________________________

2. Conchoidal: ______________________________
   ______________________________________________________________________

3. Plutonic: _______________________________
   ______________________________________________________________________

4. Clastic: ________________________________
   ______________________________________________________________________

5. Adularescence: _________________________
   ______________________________________________________________________

6. Effervescence: _________________________
   ______________________________________________________________________

7. Aphanitic: ______________________________
   ______________________________________________________________________

8. Pseudomorph: __________________________
   ______________________________________________________________________

9. Secondary mineral: ______________________
   ______________________________________________________________________

10. Vitreous: ______________________________
    ______________________________________________________________________
Section 8: (1pt per blank)

Complete the following chart (each blank is worth one point):

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Color</th>
<th>Cleavage/Fracture</th>
<th>Hardness</th>
<th>Streak</th>
<th>Luster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td>Grey/black</td>
<td>Basal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biotite</td>
<td>Black</td>
<td></td>
<td></td>
<td>White/gray</td>
<td>Vitreous</td>
</tr>
<tr>
<td>Pyrite</td>
<td>Irregular</td>
<td>6-6.5</td>
<td></td>
<td>White</td>
<td>Vitreous</td>
</tr>
<tr>
<td>Yellow-green</td>
<td>Irregular fracture</td>
<td>6.5-7</td>
<td></td>
<td>White</td>
<td>Vitreous</td>
</tr>
<tr>
<td>Albite</td>
<td>2 faces @ 90 degrees</td>
<td>6-6.5</td>
<td></td>
<td>White</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Very wide range</td>
<td>Perfect octahedral</td>
<td>4</td>
<td>White</td>
<td>Vitreous</td>
</tr>
</tbody>
</table>

Section 9: (2pts each)

Answer the following questions on miscellaneous topics.

1. What is Bowen’s reaction series? ______________________________________
   ______________________________________________________________________
   ______________________________________________________________________

2. What are the names of the two branches in Bowen’s reaction series? __________
   ______________________________________________________________________
   ______________________________________________________________________

3. What is the difference between cleavage and fracture? ______________________
   ______________________________________________________________________
   ______________________________________________________________________

4. Name three of the defining characteristics of a mineral. ___________________
   ______________________________________________________________________
   ______________________________________________________________________

5. Why is it important to look at multiple physical properties when identifying a mineral? Provide evidence for your reasoning. __________________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
Section 10: (1pt each – 8pts total)

Fill in the blanks on the rock cycle diagram (each blank is worth one point).

1. ____________________________________
2. ____________________________________
3. ____________________________________
4. ____________________________________
5. ____________________________________
6. ____________________________________
7. ____________________________________
8. ____________________________________
Section 11 (the moment you’ve all been waiting for): (1pt each blank)

Identify each of the rock and mineral samples (one point each) and answer the question to follow (also one point each).

1. Sample: ____________________________

2. What is this sample an ore of? ______________________________________________________________________________________________

3. Sample: ____________________________

4. What is the parent rock of this sample? ______________________________________________________________________________________________

5. Sample: ____________________________

6. What class does this mineral belong to? ______________________________________________________________________________________________

7. Sample: ____________________________

8. How is this sample formed? ______________________________________________________________________________________________

9. Sample: ____________________________

10. Is this sample intrusive or extrusive? ______________________________________________________________________________________________

11. Sample: ____________________________

12. What types of rock is this sample most often found in? ______________________________________________________________________________________________
13. Sample: _____________________________

14. Where does this rock get its name from? _____________________________

15. Sample: _____________________________

16. What is this particular sample nicknamed? _____________________________

17. Sample: _____________________________

18. What type of sedimentary rock is this sample commonly associated with? _____________________________

19. Sample: _____________________________

20. What mineral has the same chemical formula as this sample? _____________________________

21. Sample: _____________________________

22. Why are the crystals in this sample so large? _____________________________

23. Sample: _____________________________

24. What is this particular variety called? _____________________________
25. Sample: __________________________

26. What is this sample often used for?

27. Sample: __________________________

28. What is the red version of this sample more commonly known as? ______________

29. Sample: __________________________

30. What is the nickname for this sample? __________________________