SCHOOL: _____Key_____ TEAM NUMBER: _____

Rocks and Minerals Exam

2018 Regional Tournament

Team Number (on your wristband): _____ Division: C

Team/School Name: _____

(No Abbreviations)

Student Names (First & Last):

1. _____

2. _____

Total Points Possible: 57 points

Total Points Earned: _____

Rank: _____

Tie-breakers:

1. Did the team get the tie-breaker questions right? If so, how many points? _____

Rules Violations Y/N Explain:

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Directions for Contestants

1. Do not touch any of the sample or papers covering them until we begin.

2. PLEASE TREAT THE SAMPLES WITH CARE!!!!

3. Write your school, team number, and your name(s) legibly on ALL answer sheets.

4. There are 8 stations and 1 optional tiebreaker station. At each station, read the directions and answer the questions about the specimens.

5. You will be given 5 minutes at each mineral/rock identification station. When time is up, proceed to the next station as directly by the exam proctor and begin work at once. If you have extra time at the station, feel free to work on the written questions.

6. You may use any printed resources, written notes and/or keys as per the competition rules.

7. Make sure you write neatly and spell correctly. At the End of the Competition

8. Be sure you have properly filled in each answer neatly.

9. Make sure your school name and team number are on the answer sheet.

10. Do not leave until your paper has been collected.

11. Each of the multiple choice questions is worth 1 point. Each of the rock cycle steps is also worth one point. Rock identification is worth 2 points for each blank.

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Part I: Written Questions (1 Point for each correct)

Q1: Composed of calcite ($CaCO_3$) this type of rock has several purposes. It is used as an acid reducer in common pharmaceuticals (Tums and Alka Seltzer), used to reduce the aciditiy in crops in its form called "lime", can be used in paint as a "whitener", and makes for a great building material. Travel the world and see it at the Taj Mahal, or take a train to D.C. and view its use at the Washington Monument.

a. Calcite
b. Marble
c. Granite
d. Limestone

Q2: Commonly found in shallow, clear, warm waters, and usually made from either the calcium carbonate skeletons of some aquatic friends or by the precipitation of calcium carbonate from lake or ocean water. Which rock am I?

a. Dolomite
b. Slate
c. Breccia
d. Limestone

Q3: Fracking is most commonly used to extract natural gas from _____.

a. Sandstone
b. Shale
c. Breccia
d. Limestone

Q4: Which of the following correctly lists the rocks from lowest to highest grade of metamorphism? (Lowest on left)

a. shale, slate, phyllite, schist, gneiss
b. shale, phyllite, schist, slate, gneiss
c. gneiss, schist, phyllite, slate, shale
d. slate, shale, phyllite, gneiss, schist

Q5: Which is the first mineral to crystallize from the very high temperatures as magma first starts to cool in Bowens Reaction Series?

a. Pyroxene
b. Olivine
c. Amphibole
d. Biotite

Q6: Which is the last mineral to form from the last remaining melt of high silica content in Bowens Reaction Series?

a. Muscovite
b. Olivine
c. Anorthite
d. Quartz

Q7: Bowen's reaction series indicates that minerals with the _____ melting temperatures crystallize from a cooling magma before those with _____ melting points.

a. Lowest, Highest
b. Highest, Lowest

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Q8: Which mineral listed does NOT have a botryoidal mineral habit?

a. Hematite
b. Pyrite
c. Malachite
d. Barite

Q9: What mineral habit does Tremolite have?

a. Plumose
b. Reticulated
c. Fibrous
d. Bladed

Q10: This mineral has the same chemical formula as Diamond but, unlike Diamond, it is not hard, is opaque, and has about half the density of Diamond.

a. Aragonite
b. Graphite
c. Azurite
d. Dolomite

Q11: Obsidian is an igneous rock with this type of rock texture.

a. Porphyritic
b. Pyroclastic
c. Glassy
d. Frothy

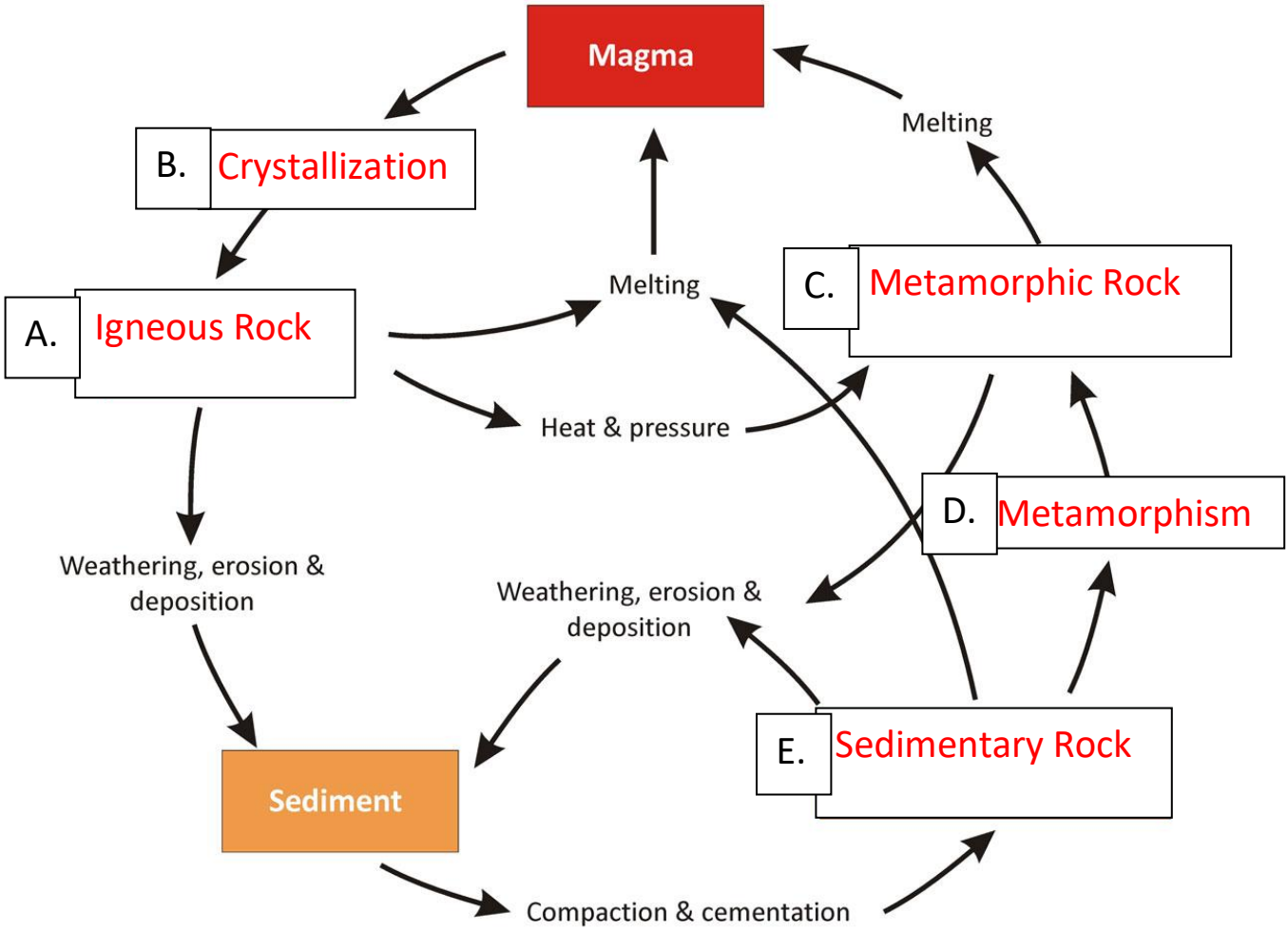
Q12: Match the following: (1 point for each correct pairing)

1. Cu c.
2. Au e.
3. Graphite b.
4. S a.
5. Ag d.

a. You might find this in a lead-acid car battery. It is characterized as being soft, pale yellow, brittle and, odorless (although in some compounds it smells like rotten eggs).
b. Composed exclusively of the element Carbon. Has a black streak and a hardness of 1-2. Has a metallic luster.
c. Soft, malleable, ductile, used extensively for its ability to conduct heat and electricity. Gradually tarnishes to a dull, brownish color.
d. Soft, malleable, ductile, lustrous with the highest electrical and thermal conductivity of all those listed. Found in jewelry and forks.
e. The MOST malleable and ductile of all those listed. Soft and yellow. It is able to conduct heat and electricity. Very high density and used extensively in electronics.

Part II: The Rock Cycle (1 Point for each box)

Q13: Fill in each step of the rock cycle with the most appropriate term.



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Part III: Identifying Rocks (2 Point for each blank)

Station I: Igneous Rocks Part 1:

Q14: Determine the name of each of the two Igneous rock samples. You may use any resources but be as detailed as possible.

Sample A: _____Diorite_____

Sample B: _____Pumice_____

Station II: Igneous Rocks Part 2:

Q15: Determine the name of each of the two Igneous rock samples. You may use any resources but be as detailed as possible.

Sample A: _____Obsidian_____

Sample B: _____Scoria_____

Station III: Metamorphic Rocks Part 1:

Q16: Determine the name of each of the two Metamorphic rock samples. You may use any resources but be as detailed as possible.

Sample A: _____Slate_____

Sample B: _____Garnet Schist_____

Station IV: Metamorphic Rocks Part 2:

Q17: Determine the name of each of the two Metamorphic rock samples. You may use any resources but be as detailed as possible.

Sample A: _____Phyllite_____

Sample B: _____Gneiss_____

Station V: Sedimentary Rocks Part 1:

Q18: Determine the name of each of the two Sedimentary rock samples. You may use any resources but be as detailed as possible.

Sample A: _____Breccia_____

Sample B: _____Chert_____

Station VI: Sedimentary Rocks Part 2:

Q19: Determine the name of each of the two Sedimentary rock samples. You may use any resources but be as detailed as possible.

Sample A: _____Diatomite_____

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Sample B: _____Sandstone_____

Station VII: Minerals Part I:

Q20: Determine the name of each of the three Mineral samples. You may use any resources but be as detailed as possible.

Sample A: _____Ulexite_____

Sample B: _____Angonite_____

Sample C: _____Biotite_____

Station VIII: Minerals Part II:

Q21: Determine the name of each of the three Mineral samples. You may use any resources but be as detailed as possible.

Sample A: _____Muscovite_____

Sample B: _____Halite_____

Sample C: _____Pyrite_____

Station X: TIEBREAKER: (OPTIONAL) (If a tie then each of these questions is worth 2 points)

Q22: What is another name (non-scientific) for Sample C in Station VIII Q21? (Hint: it is often confused with an element): _____Fool's Gold_____

Q23: What is the typical hardness of Sample B in Station VIII Q21? _____2.5_____

Q24: What would you expect the streak to be for Sample A in Station VIII Q21? _____white_____