

HSAG Mineral and Rock Exam 2014

Note: Most sample numbers do NOT match question numbers so be careful. Team:

1. What is **sample 1A**?
 - a. magnetite
 - b. galena
 - c. pyrite
 - d. chalcopyrite
 - e. copper
 - f. graphite
 - g. amphibole

2. What is **sample 1B**?
 - a. chalcopyrite
 - b. plagioclase feldspar
 - c. muscovite
 - d. copper
 - e. magnetite
 - f. galena
 - g. pyrite

3. Which characteristic is the best way to tell **samples 1A and 1B** apart?
 - a. 1A has a hardness greater than that of 1B
 - b. 1B has a red streak
 - c. 1A has cubic crystals
 - d. 1B has cubic crystals
 - e. 1A has two cleavage directions at 90°
 - f. 1A has rhombic crystals
 - g. 1A has octahedral crystals

4. What is **sample 2A**?
 - a. galena
 - b. amphibole
 - c. chalcopyrite
 - d. graphite
 - e. magnetite
 - f. biotite
 - g. hematite

5. What is **sample 2B**?
 - a. galena
 - b. amphibole
 - c. chalcopyrite
 - d. graphite
 - e. magnetite
 - f. biotite
 - g. hematite

6. Which characteristic is the best way to tell **samples 2A and 2B** apart?

- a. 2A has a hardness of 7
- b. 2B has a red streak
- c. 2A is nonmetallic
- d. 2B can be scratched by a penny
- e. 2A has two directions of cleavage
- f. 2A has a specific gravity greater than 4.0
- g. 2B is magnetic and 2A is not

7. Which characteristic is shared by **3A and 3B**?

- a. cubic cleavage
- b. magnetic
- c. rhombic cleavage
- d. nonmetallic
- e. hardness of 4
- f. translucent
- g. striations

8. What is one way to distinguish between **3B and 3C**?

- a. 3B has two cleavage directions, and 3C has no cleavage direction
- b. 3B has cubic cleavage, and 3C has rhombic cleavage
- c. 3B has a hardness greater than 4, while 3C has a hardness less than 4
- d. 3B reacts with acid, and 3C does not
- e. 3B smells like sulfur, and 3C does not
- f. 3B has rhombic cleavage, and 3c has cubic cleavage
- g. 3B has one cleavage direction, and 3C has two cleavage directions

9. What is **sample 3A**?

- a. hematite
- b. chalcopryrite
- c. pyrite
- d. muscovite
- e. plagioclase feldspar
- f. native silver
- g. galena

10. How many directions of cleavage does **sample 4** have?

- a. 0
- b. 1
- c. 2
- d. 3
- e. 4
- f. 6

11. What is **sample 4**?

- a. galena

- b. biotite
- c. muscovite
- d. hematite
- e. graphite
- f. amphibole
- g. chalcopyrite

12. Which of the following is a diagnostic property of **sample 5**?

- a. hardness of 7
- b. hardness of 4
- c. metallic luster
- d. grey streak
- e. two cleavage directions
- f. rhombic cleavage
- g. reacts with acid

13. What is **sample 5**?

- a. fluorite
- b. dolomite
- c. halite
- d. quartz
- e. gypsum
- f. galena
- g. calcite

14. Which of the following is a diagnostic property of **sample 6**?

- a. one cleavage direction
- b. metallic luster
- c. reacts with acid
- d. hardness of 7
- e. vitreous luster
- f. specific gravity greater than 6
- g. tastes salty (ASK THE TEACHER, IF NEEDED, DON'T LICK THIS SAMPLE)

15. What is **sample 6**?

- a. fluorite
- b. dolomite
- c. halite
- d. quartz
- e. gypsum
- f. galena
- g. calcite

16. Which of the following are diagnostic properties of **sample 7**?

- a. rhombic cleavage and exsolution lamellae
- b. translucent and exsolution lamellae

- c. translucent and two cleavage directions at 60° and 120°
- d. specific gravity of 6 and earthy luster
- e. striations and hardness of 4
- f. hardness of 6 and metallic luster
- g. striations and two cleavage directions at 90°

17. What is **sample 7**?

- a. amphibole
- b. plagioclase feldspar
- c. potassium feldspar
- d. pyrite
- e. dolomite
- f. quartz
- g. fluorite

18. Which best describes the texture of **sample 8**?

- a. slaty
- b. glassy
- c. schistose
- d. gneissic
- e. phyllitic
- f. migmatitic
- g. non-foliated

19. What is **sample 8**?

- a. shale
- b. phyllite
- c. schist
- d. slate
- e. quartzite
- f. marble
- g. obsidian

20. What is the dominant mineral in **sample 9**?

- a. limestone
- b. dolomite
- c. calcite
- d. shale
- e. fluorite
- f. quartz
- g. plagioclase feldspar

21. What is **sample 9**?

- a. siltstone
- b. quartz sandstone
- c. dolostone

- d. calcite
- e. conglomerate
- f. breccia
- g. fossiliferous limestone

22. What is the texture of **sample 10**, and what is the dominant mineral present in this sample?

- a. phyllitic, amphibole
- b. schistose, biotite
- c. gneissic, muscovite
- d. non-foliated, magnetite
- e. slaty, hematite
- f. glassy, galena
- g. schistose, garnet

23. What is **sample 10**?

- a. gneiss
- b. quartzite
- c. schist
- d. phyllite
- e. conglomerate
- f. marble
- g. breccia

24. What is the texture of **sample 11**, and what type of rock is this sample?

- a. sand-sized moderately sorted sub-rounded grains, clastic
- b. sand-sized well sorted rounded grains, chemical
- c. silt-sized grains, chemical
- d. silt-sized grains, volcanic
- e. silt-sized grains, clastic
- f. gravel-sized moderately well sorted, rounded grains, clastic
- g. gravel-sized well sorted, angular grains, chemical

25. What is **sample 11**?

- a. conglomerate
- b. gypsum
- c. dolostone
- d. arkose
- e. quartz sandstone
- f. shale
- g. quartzite

26. What is **sample 12**, and what is its environment of deposition?

- a. dolostone, mountain
- b. dolostone, marine
- c. calcite, mountain
- d. calcite, marine

- e. quartz sandstone, river
- f. arkose, mountain
- g. gypsum, river

27. What is the texture and environment of formation of **sample 13**? This is a cut and polished slab.

- a. porphyritic, volcano
- b. porphyritic, mountain
- c. aphanitic/fine-grained, intrusive
- d. pegmatitic/very coarse-grained, volcano
- e. pegmatitic/very coarse-grained, mountain
- f. phaneritic/coarse-grained, volcano
- g. phaneritic/coarse-grained, intrusive

28. What is **sample 13**?

- a. basalt
- b. granite-pegmatite
- c. granite
- d. andesite
- e. arkose
- f. gabbro
- g. rhyolite

29. What is **sample 14**, and what is its environment of formation?

- a. phyllite, formed near ocean trench in shallow subduction zone
- b. schist, formed near ocean trench in shallow subduction zone
- c. granite, formed by burial deep in volcanic arc
- d. granite, intrusive
- e. marble, formed by deep burial
- f. marble, intrusive
- g. quartzite, contact metamorphism

30. What is the texture of **sample 15**?

This is a cut and polished slab.

- a. aphanitic/fine-grained
- b. porphyritic
- c. phaneritic/coarse-grained
- d. frothy/vesicular
- e. pyroclastic
- f. glassy
- g. pegmatitic/very coarse-grained

31. Which light-colored mineral is present in **sample 15**?

- a. feldspar
- b. halite
- c. muscovite
- d. fluorite
- e. gypsum

- f. garnet
- g. dolomite

32. What is **sample 15**?

- a. rhyolite
- b. andesite
- c. basalt
- d. gabbro
- e. scoria
- f. granite

33. What is the texture of **sample 16**, and what type of rock is this?

- a. gravel-sized poorly sorted angular grains, clastic
- b. sand-sized well sorted rounded grains, chemical
- c. gravel-sized moderately sorted rounded grains, clastic
- d. silt-sized grains, biochemical
- e. gravel-sized well sorted well rounded grains, chemical
- f. microcrystalline, biochemical
- g. clay-sized grains, chemical

34. What is **sample 16**?

- a. quartz sandstone
- b. conglomerate
- c. quartzite
- d. breccia
- e. granite-pegmatite
- f. dolostone
- g. metaconglomerate

35. What is the texture of **sample 17**, and what is its environment of formation?

- a. aphanitic/fine-grained, metamorphic
- b. phaneritic/coarse-grained, intrusive
- c. frothy/vesicular, volcano
- d. aphanitic/fine-grained, volcano
- e. pyroclastic, volcano
- f. pegmatitic/very coarse-grained, intrusive
- g. porphyritic, volcanic

36. What is **sample 17**?

- a. gabbro
- b. diorite
- c. scoria
- d. rhyolite
- e. basalt
- f. peridotite

g. hematite

37. What is **sample 18**, and what is its texture?

- a. schist, foliated
- b. phyllite, phyllitic
- c. quartzite, non-foliated
- d. marble, granular
- e. gneiss, gneissic
- f. gneiss, non-foliated
- g. slate, slaty

38. What is the texture of **sample 19**, and what is its environment of formation?

- a. pegmatitic/very coarse-grained, intrusive
- b. pegmatitic/very coarse-grained, volcano
- c. phaneritic/coarse-grained, intrusive
- d. phaneritic/coarse-grained, volcano
- e. aphanitic/fine-grained, volcano
- f. porphyritic, intrusive
- g. porphyritic, volcano

39. What is **sample 19**?

- a. rhyolite
- b. granite
- c. andesite
- d. granite-pegmatite
- e. diorite
- f. schist
- g. gabbro

40. What is **sample 20**, and what is its texture?

- a. obsidian, glassy
- b. obsidian, aphanitic/fine-grained
- c. scoria, glassy
- d. scoria, frothy/vesicular
- e. basalt, aphanitic/fine-grained
- f. gabbro, phaneritic/coarse-grained
- g. volcanic tuff, pyroclastic

41. What is the texture of **sample 21**, and what is the dominant mineral in this sample?

- a. sand-sized well sorted rounded grains, quartz
- b. gravel-sized well sorted rounded grains, potassium feldspar
- c. silt-sized grains, halite
- d. gravel-sized well sorted well rounded grains, plagioclase feldspar
- e. sand-sized poorly sorted angular grains, plagioclase feldspar
- f. silt-sized grains, quartz
- g. clay-sized grains, halite

42. What is **sample 21**?
- a. arkose
 - b. rock salt
 - c. shale
 - d. quartz sandstone
 - e. quartzite
 - f. breccia
 - g. dolostone
43. What is the texture of **sample 22**, and what type of environment was it formed in?
- a. aphanitic/fine-grained, volcano
 - b. phaneritic/coarse-grained, intrusive
 - c. pegmatitic/very coarse-grained, intrusive
 - d. pyroclastic, volcano
 - e. porphyritic, volcano
 - f. aphanitic/fine-grained, intrusive
 - g. pegmatitic/very coarse-grained, volcano
44. What is **sample 22**?
- a. peridotite
 - b. rhyolite
 - c. andesite
 - d. hematite
 - e. basalt
 - f. diorite-pegmatite
 - g. gabbro
45. What is **sample 23**, and what type of environment was it formed in?
- a. gabbro, marine
 - b. gabbro, volcano
 - c. scoria, swamp
 - d. basalt, volcano
 - e. shale, marine
 - f. coal, volcano
 - g. coal, swamp
46. Which texture is shared by **24A, 24B, and 24C**?
- a. phaneritic/fine-grained
 - b. glassy
 - c. pegmatitic/very coarse-grained
 - d. porphyritic
 - e. frothy/vesicular
 - f. aphanitic/fine-grained
47. Was **24A or 24B** associated with a more explosive eruption?

- a. 24A
- b. 24B

48. What is sample **24A**?

- a. obsidian
- b. pumice
- c. rhyolite
- d. gabbro
- e. scoria
- f. andesite
- g. dolostone

49. What is **sample 25**, and what is its texture?

- a. slate, slaty
- b. quartz sandstone, sand-sized well sorted rounded grains
- c. arkose, medium-grained
- d. marble, granular
- e. schist, schistose
- f. shale, fissile
- g. dolostone, cryptocrystalline

50. Which of the following is a diagnostic property of **sample 26**?

- a. striations
- b. two cleavage directions not at 90°
- c. two cleavage directions at 90°
- d. pink streak
- e. magnetic
- f. reacts with acid

**Samples 1A
and 1B
Questions**

**Samples 2A
and 2B
Questions**

**Samples 3A,
3B, and 3C
Questions**

1, 2, 3

4, 5, 6

7, 8, 9

**Sample 4
Questions
10, 11**

**Sample 5
Questions
12, 13**

**Sample 6
Questions
14, 15**

**Sample 7
Questions
16, 17**

**Sample 8
Questions
18, 19**

**Sample 9
Questions
20, 21**

**Sample 10
Questions
22,23**

**Sample 11
Questions
24, 25**

**Sample 12
Question
26**

**Sample 13
Questions
27, 28**

**Sample 14
Question
29**

**Sample 15
Questions
30,31,32**

Sample 16
Questions
33, 34

Sample 17
Questions
35, 36

Sample 18
Question
37

Sample 19
Questions
38,37

Sample 20
Question
40

Sample 21
Questions
41, 42

Sample 22
Questions
43, 44

Sample 23
Questions
45

Samples
24A, 24b,
and 24C
Question
46,47,48

Sample 25
Question
49

Sample 26
Questions
50

Sample 1A
Questions
1, 2, 3

Samples 2A
Questions
4, 5, 6

Samples 3A
Questions
7, 8, 9

Sample 1B
Questions
1, 2, 3

Samples 2B
Questions
4, 5, 6

Samples 3B
Questions
7, 8, 9

Sample 3C
Questions
7, 8, 9

Sample 24A
Questions
46,47,48

Sample 24B
Questions
46,47,48

Samples 24C
Question
46,47,48