

NCSO Rocks & Minerals 2018 State Finals Answer Key – Division B

Station 1.

1-3. Circle one: **Igneous** **Metamorphic** **Sedimentary**

1-4. Mineral name: Staurolite or Garnet

Station 2.

2-1. Circle one: **A** **B** **C** **D** **E**

2-2. Mineral name: Beryl

Station 3

3-1. Mineral name: Quartz

3-2. Rock name: Dolostone

Station 4

Circle two: **Isometric** **Tetragonal** **Hexagonal** **Orthorhombic** **Monoclinic** **Triclinic**

Station 5

5-1. Circle one: **A** **B** **C** **D**

5-2. Circle one: **A** **B** **C** **D**

5-3. Circle one: **A** **B** **C** **D**

5-4. Circle one: **A** **B** **C** **D**

Station 6

6-1. Quartz

6-2. Amethyst

6-3. Conchoidal

6-4. No

Station 7

7-1. Circle one: **A** **B** **C** **D** **E**

7-2. Circle one: **A** **B** **C** **D** **E**

7-3. Circle one: **A** **B** **C** **D** **E**

7-4. Circle one: **A** **B** **C** **D** **E**

Station 8

8-1. Mineral name: K-feldspar

8-2. Mineral name: (Perthitic) Orthoclase quartz

Station 9

9-1. Mineral name: Biotite

9-2. Property: (One perfect) Cleavage or Hardnes 2-3

Station 10

10-1. Circle one: **A B C D E**

10-2. Circle one: **A B C D E**

10-3. Circle one: **A B C D E**

10-4. Circle one: **A B C D E**

Station 11

11-1. Circle one: **A B C D E**

11-2. Circle one: **A B C D E**

11-3. Circle one: **A B C D E**

11-4. Circle one: **A B C D E**

Station 12

12-1. Circle one: **A B C D E**

12-2. Circle one: **A B C D E**

Station 13

13-1. Mineral name: Tourmaline Crystal system: Hexagonal

13-2. Mineral name: Pyrite Crystal system: Isometric

Station 14

14-1. Circle one: **A B C D E**

14-2. Circle one: **A B C D E**

Station 15

15-1. Mineral name: Fluorite

15-2: Crystal form: Octahedron

Station 16

16-1. Circle one: A B C D E

16-2. Circle one: A B C D E

Station 17

17-1. Circle one: A B C D

17-2. Circle one: A B C D

17-3. Circle one: A B C D

17-4. Circle one: A B C D

Station 18

18-1. Circle one: D C N

18-2. Circle one: D C N

18-3. Circle one: D C N

18-4. Circle one: D C N

Station 19

19-1. Circle one: A B C D E

19-2. Circle one: A B C D E

19-3. **Describe:** River channel, alluvial fan, higher energy, etc. vs. floodplain, mudflat, low energy, etc.

Station 20

11-1. Circle one: A B C D E F G H I

11-2. Circle one: A B C D E F G H I

11-3. Circle one: A B C D E F G H I

11-4. Circle one: A B C D E F G H I

Station 1

- 1-1. Is this rock igneous, metamorphic, or sedimentary?

- 1-2. Identify either one of the two minerals indicated (either the reddish, round one or the long dark one).

Station 2

2-1. Examine this specimen, which is from a large deposit that is mined near the coast of North Carolina. What type of ore is this?

- A. Copper
- B. Gold
- C. Chromium
- D. Silver
- E. Phosphate

2-2. This mineral is closely related to North Carolina's State Gemstone. Identify **this** specimen (not the State Gemstone).

Station 3

3-1. Examine closely these specimens known popularly as **Herkimer Diamonds**. If you have one, you may want to use a hand lens or magnifying glass. (There are four tiny specimens in the glass vial; **do not open the vial**. There is a slightly larger one that you may test.) These are not true diamonds. They are crystals of what mineral?

3-2. This is a sample of the rock in which Herkimer Diamonds are found. They are found in the small cavities, or vugs. Chemically, the rock is composed of about equal parts magnesium carbonate and calcium carbonate. What is the name of the rock?

Station 4

(Tiebreaker 1) Name the **two** crystal systems in which crystals can have an axis of four-fold rotational symmetry. These are the crystal systems: Isometric; Tetragonal; Hexagonal; Orthorhombic; Monoclinic; Triclinic

Station 5

Match the following minerals (listed by chemical formula) with the **group** to which they belong. Use letters (A, B, C, D) to indicate the group; **each letter is used once.**

5-1. KAlSi_3O_8

5-2. $\text{Mn}_3\text{Al}_2\text{Si}_3\text{O}_{12}$

5-3. $\text{KMg}_3\text{Si}_3\text{AlO}_{10}(\text{OH})_2$

5-4. MnSiO_3

Groups:

A. Garnet

B. Mica

C. Feldspar

D. Pyroxene

Station 6

6-1. I am a variety of _____.

6-2. I am known as (my variety name is) _____.

6-3. I have _____ fracture.

6-4. I have _____ cleavage.

Station 7

Take a look at these five rocks, labelled 7A, 7B, etc.

Use the correct **letter** to answer these questions.

7-1. Which one of them is the state rock of North Carolina?

7-2. Which one of them is the most abundant rock type in Hawaii?

7-3. Which one of them was produced by regional metamorphism?

7-4. Which one of them is the volcanic equivalent of granite?

Station 8

What are the two minerals that make up this specimen?

Station 9

9-1. Identify this mineral.

9-2. Name one property that this mineral has in common with muscovite.

Station 10

*From the descriptions, identify the following sedimentary rocks. From the following list of answers, **circle the correct letter** to answer questions 10-1 to 10-4. **Letters may be used any number of times, including zero.***

Answer List:

A. Coquina

B. Diatomite

C. Breccia

D. Chalk

E. Oolitic limestone

10-1. This clastic rock has angular fragments of minerals or of pre-existing rocks, cemented together.

10-2. This rock is composed of tiny (usually 0.25 – 2 mm) spherical grains that have concentric layers. These spheres are most often composed of calcite.

10-3. This rock is formed in deep water by accumulation of **silica**-rich fossilized remains of tiny marine organisms.

10-4. This rock is commonly found in southeastern North Carolina, and is composed of relatively large fragments of fossil shells, cemented together.

Station 11

Match each metamorphic rock with its most likely precursor (parent rock or protolith), by circling the correct letter on the answer sheet. **Letters may be used any number of times, including zero.**

11-1. ___ Schist

11-2. ___ Quartzite

11-3. ___ Marble

11-4. ___ Slate

A. limestone

B. granite

C. sandstone

D. shale

E. andesite

Station 12

12-1. The mineral talc makes up a rock called soapstone, also known as steatite. Ancient cultures have left many artifacts made from this kind of rock. Which of the following types of soapstone or steatite artifacts would probably be most common?

- A. Spearpoints
- B. Arrowheads
- C. Bowls
- D. Chisels
- E. Scrapers

12-2. Which of these igneous rock types was most prized among Native Americans for use in making blades and spear points?

- A. Pumice
- B. Granite
- C. Andesite
- D. Basalt
- E. Obsidian

Station 13

Identify these two minerals **and** the crystal system to which each belongs. Crystal systems are Isometric; Tetragonal; Hexagonal; Orthorhombic; Monoclinic; Triclinic.

Mineral

Crystal System

13-1: _____

13-2: _____

Station 14

Identify these two blue minerals by choosing from this list of possibilities. Circle the correct letter on your answer sheet.

- A. Amazonite
- B. Azurite
- C. Sodalite
- D. Kyanite
- E. Beryl

14-1: _____

14-2: _____

Station 15

What is this mineral and what is the **crystal form** (**not** crystal system) of this specimen?

15-1. Mineral: _____

15-2. Crystal Form: _____

Station 16

16-1. What is the **texture** of this igneous rock?

- A. Smooth
- B. Bumpy
- C. Phaneritic
- D. Porphyritic
- E. Coarse-grained

16-2. What is the **texture** of this metamorphic rock?

- A. Rough
- B. Silky
- C. Schistose
- D. Porphyritic
- E. Gneissic

Station 17

Match the outstanding physical property demonstrated by each of these white mineral specimens by selecting the correct letter. Circle the correct letter for each one on your answer sheet; **letters are used once each.**

- | | |
|-------------|--------------------------------------|
| 17-1. _____ | A. high specific gravity |
| 17-2. _____ | B. sticks to tongue |
| 17-3. _____ | C. three cleavages not at 90 degrees |
| 17-4. _____ | D. two cleavages at 90 degrees |

Station 18

Bowen's Reaction Series: Identify the following according to whether they belong to the discontinuous reaction series (**D**), continuous reaction series (**C**), or neither (**N**). For each mineral, circle the correct letter on your answer sheet.

18-1. Biotite

18-2. Plagioclase

18-3. Epidote

18-4. Amphibole (hornblende)

Station 19

19-1. Examine this rock, which comes from one of the Triassic basins in North Carolina.

It is a/an _____ rock.

- A. Volcanic
- B. Detrital (clastic) sedimentary
- C. Nondetrital sedimentary
- D. Biogenic
- E. Non-foliated metamorphic

19-2. This rock is best classified as _____.

- A. Pegmatite
- B. Rhyolite
- C. Phyllite
- D. Conglomerate
- E. Travertine

19-3. **Tiebreaker 2:** Describe how the environment of deposition (formation) of this rock would differ from that of shale (mudstone).

Station 20

Identify the following four rocks, using letters from the following list. For each rock, circle the correct letter on your answer sheet. **(Answers may be used any number of times, including zero):**

- A. Rhyolite B. Scoria C. Arkose
- D. Schist E. Slate F. Obsidian
- G. Gabbro H. Diorite I. Coal

20-1. _____

20-2. _____

20-3. _____

20-4. _____