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Continuing Education Course #492
Systems: Tectonic & Hydrologic - Field Study
Observations & Interpretations - Part 2

1. The Cumberland Valley dike was created as a result of the continental collision of North America and North Africa due to the intense volcanic activity that is typical of that type of geological event.
 a. True
 b. False
2. A dike is a tabular body of intrusive rock injected between layers of the enclosing rock.
 a. True
 b. False
3. The Cumberland Valley is just one of the _____ Great Appalachian Valleys that extend from Vermont to Alabama.
 a. two
 b. six
 c. nine
 d. fourteen
4. According to the geologic map, the dike is _____ rock.
 a. diabase
 b. limestone
 c. dolomite
 d. chert
5. After erosion, the surface expression of a dike is usually a long narrow ridge.
 a. True
 b. False
6. The geological structure of a dike is most similar to which of the following shapes?
 a. cone
 b. sphere
 c. cylinder
 d. ellipse
7. What are the approximate dimensions of the Cumberland Valley dike - width and length?
 a. width is between 0.25-0.60in; length is 12 feet
 b. width is between 0.25-0.60in; length is 3 miles
 c. width is between 75-150ft; length is 8 miles
 d. width is between 800-2000ft; length is 40 miles
8. Which of the following best describes observation point #6 on the map in Figure 2.6?

- a. [AT & Rt 11] Dike west branch segment crossing Rt 11.
- b. [AT on Appalachian Dr over PA Turnpike] Dike exposed both sides of highway.
- c. [AT] Dike follows Appalachian Dr from PA Turnpike to Chambers farm cemetery.
- d. [Ridge Rd] Dike follows Ridge Rd to Rt 74 junction; diabase dike walls along road.

9. Ordovician outcrop samples collected at each of the four mapped locations tested positive to an acid test; i.e. reacted to a 10% Hydrochloric Acid solution; therefore, rock outcropping is likely either _____ as indicated present in the formations/group of the Cumberland Valley Sequence per the geologic map.

- a. limestone or dolomite
- b. shale or siltstone
- c. siltstone or sandstone
- d. conglomerate or chert

10. Which rock classification does diabase belong to?

- a. sedimentary
- b. metamorphic
- c. igneous
- d. none of the above

11. What are the key characteristics of diabase rock?

- a. Same mineral composition as basalt and gabbro
- b. Grain size = Medium-grained rock: 0.1-2mm, due to magma cooling rate between basalt (faster) and gabbro (slower)
- c. Mafic rock: consisting of dark-colored iron and magnesium rich minerals like olivine and pyroxene.
- d. All of the above

12. _____ is present in all of the Cumberland Valley Sequence rock units which the dike passes through from the north at the Conodoguinet Creek to the south at Boiling Springs.

- a. Limestone
- b. Shale
- c. Siltstone
- d. Sandstone

13. Between 450 to 260 mya, tectonic processes from a series of _____ mountain building events uplifted the Cumberland Valley, moved the area northward, and would transform this epicontinental sea into a great mountain range, the Appalachians, comparable to the Rocky Mountains of today.

- a. two
- b. three
- c. four
- d. five

14. Between 260 and 240 mya in the early to middle Triassic, after fracturing of the sedimentary strata, the _____ filled the fracture, consequently becoming a diabase dike.

- a. basaltic lava
- b. silicic lava
- c. basaltic magma
- d. silicic magma

15. Continual _____ best describe the last 240 million years of the Cumberland Valley dike and the Appalachian Mountains in general.

- a. erosion
- b. mountain building

- c. limestone forming
- d. dike forming

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