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Reading Practice Set 1: Passage and Questions

Directions: Read the passage. Then answer the questions. Give yourself 20 minutes to complete this practice set.

RUNNING WATER ON MARS?

1 Photographic evidence suggests that liquid water once existed in great quantity on the surface of Mars. Two types of flow features are seen: runoff channels and outflow channels. Runoff channels are found in the southern highlands. These flow features are extensive systems—sometimes hundreds of kilometers in total length—of interconnecting, twisting channels that seem to merge into larger, wider channels. They bear a strong resemblance to river systems on Earth, and geologists think that they are dried-up beds of long-gone rivers that once carried rainfall on Mars from the mountains down into the valleys. Runoff channels on Mars speak of a time 4 billion years ago (the age of the Martian highlands), when the atmosphere was thicker, the surface warmer, and liquid water widespread.

2 Outflow channels are probably relics of catastrophic flooding on Mars long ago. They appear only in equatorial regions and generally do not form extensive interconnected networks. Instead, they are probably the paths taken by huge volumes of water draining from the southern highlands into the northern plains. The onrushing water arising from these flash floods likely also formed the odd teardrop-shaped "islands" (resembling the miniature versions seen in the wet sand of our beaches at low tide) that have been found on the plains close to the ends of the outflow channels. Judging from the width and depth of the channels, the flow rates must have been truly enormous—perhaps as much as a hundred times greater than the 105 tons per second carried by the great Amazon river. Flooding shaped the outflow channels approximately 3 billion years ago, about the same time as the northern volcanic plains formed.

3 Some scientists speculate that Mars may have enjoyed an extended early period during which rivers, lakes, and perhaps even oceans adorned its surface. A 2003 Mars Global Surveyor image shows what mission specialists think may be a delta—a fan-shaped network of channels and sediments where a river once flowed into a larger body of water, in this case a lake filling a crater in the southern highlands. Other researchers go even further, suggesting that the data provide evidence for large open expanses of water on the early Martian surface. A computer-generated view of the Martian north polar region shows the extent of what may have been an ancient ocean covering much of the northern lowlands. The Hellas Basin, which measures some 3,000 kilometers across and has a floor that lies nearly 9 kilometers below the basin's rim, is another candidate for an ancient Martian sea.

4 These ideas remain controversial. Proponents point to features such as the terraced "beaches" shown in one image, which could conceivably have been left behind as a lake or ocean evaporated and the shoreline receded. But detractors maintain that the terraces could also have been created by geological activity, perhaps related to the geologic forces that depressed the Northern Hemisphere far below the level of the south, in which case they have nothing whatever to do with Martian water. Furthermore, Mars Global Surveyor data released in 2003 seem to indicate that the Martian surface contains too few carbonate rock layers—layers containing compounds of carbon and oxygen—that should have been formed in abundance in an ancient ocean. Their absence supports the picture of a cold, dry Mars that never experienced the extended mild period required to form lakes and oceans. However, more recent data imply that at least some parts of the planet did in fact experience long periods in the past during which liquid water existed on the surface.

5 Aside from some small-scale gullies (channels) found since 2000, which are inconclusive, astronomers have no direct evidence for liquid water anywhere on the surface of Mars today, and the amount of water vapor in the Martian atmosphere is tiny. Yet even setting aside the unproven hints of ancient oceans, the extent of the outflow channels suggests that a huge total volume of water existed on Mars in the past. Where did all the water go? The answer may be that virtually all the water on Mars is now locked in the permafrost layer under the surface, with more contained in the planet's polar caps.

Directions: Now answer the questions.

1. The word "merge" in the passage is closest in meaning to
(A) expand
(B) separate
(C) straighten out
(D) combine

2. What does the discussion in paragraph 1 of runoff channels in the southern highlands suggest about Mars?
(A) The atmosphere of Mars was once thinner than it is today.
(B) Large amounts of rain once fell on parts of Mars.
(C) The river systems of Mars were once more extensive than Earth's.
(D) The rivers of Mars began to dry up about 4 billion years ago.

3. The word "relics" in the passage is closest in meaning to
(A) remains
(B) sites
(C) requirements
(D) sources

4. The word "miniature" in the passage is closest in meaning to
(A) temporary
(B) small
(C) multiple
(D) familiar

5. **In paragraph 2, why does the author include the information that 105 tons of water flow through the amazon River per second?**
(A) To emphasize the great size of the volume of water that seems to have flowed through Mars' outflow channels
(B) To indicate data used by scientists to estimate how long ago Mars' outflow channels were formed
(C) To argue that flash floods on Mars may have been powerful enough to cause tear-shaped "islands" to form
(D) To argue that the force of flood waters on Mars was powerful enough to shape the northern volcanic plains

6. according to paragraph 2, all of the following are true of the outflow channels on Mars EXCEPT:
(A) They formed at around the same time that volcanic activity was occurring on the northern plains.
(B) They are found only on certain parts of the Martian surface.
(C) They sometimes empty onto what appear to have once been the wet sands of tidal beaches.
(D) They are thought to have carried water northward from the equatorial regions.

7. all of the following questions about geological features on Mars are answered in paragraph 3 EXCEPT:
(A) What are some regions of Mars that may have once been covered with an ocean?
(B) Where do mission scientists believe that the river forming the delta emptied?
(C) Approximately how many craters on Mars do mission scientists believe may once have been lakes filled with water?
(D) During what period of Mars' history do some scientists think it may have had large bodies of water?

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8. According to paragraph 3, images of Mars' surface have been interpreted as support for the idea that

(A) the polar regions of Mars were once more extensive than they are now
(B) a large part of the northern lowlands may once have been under water
(C) deltas were once a common feature of the Martian landscape
(D) the shape of the Hellas Basin has changed considerably over time

9. What can be inferred from paragraph 3 about liquid water on Mars?

(A) If ancient oceans ever existed on Mars' surface, it is likely that the water in them has evaporated by now.
(B) If there is any liquid water at all on Mars' surface today, its quantity is much smaller than the amount that likely existed there in the past.
(C) Small-scale gullies on Mars provide convincing evidence that liquid water existed on Mars in the recent past.
(D) The small amount of water vapor in the Martian atmosphere suggests that there has never been liquid water on Mars.

10. Which of the sentences below best expresses the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

(A) But detractors argue that geological activity may be responsible for the water associated with the terraces.
(B) But detractors argue that the terraces may have been formed by geological activity rather than by the presence of water.
(C) But detractors argue that the terraces may be related to geological forces in the Northern Hemisphere of Mars, rather than to Martian water in the south.
(D) But detractors argue that geological forces depressed the Northern Hemisphere so far below the level of the south that the terraces could not have been formed by water.

11. according to paragraph 4, what do the 2003 global Surveyor data suggest about Mars?

(A) Ancient oceans on Mars contained only small amounts of carbon.
(B) The climate of Mars may not have been suitable for the formation of large bodies of water.
(C) Liquid water may have existed on some parts of Mars' surface for long periods of time.
(D) The ancient oceans that formed on Mars dried up during periods of cold, dry weather.

12. The word "hints" in the passage is closest in meaning to

(A) clues
(B) features
(C) arguments
(D) effects

13. In paragraph 2 of the passage, there is a missing sentence. The paragraph is repeated below and shows four letters (A, B, C, and D) that indicate where the following sentence could be added. These landscape features differ from runoff channels in a number of ways. Where would the sentence best fit?

> Outflow channels are probably relics of catastrophic flooding on Mars long ago. (A) They appear only in equatorial regions and generally do not form extensive interconnected networks. (B) Instead, they are probably the paths taken by huge volumes of water draining from the southern highlands into the northern plains. (C) The onrushing water arising from these flash floods likely also formed the odd teardrop-shaped "islands" (resembling the miniature versions seen in the wet sand of our beaches at low tide) that have been found on the plains close to the ends of the outflow channels. (D) Judging from the width and depth of the channels, the flow rates must have been truly enormous—perhaps as much as a hundred times greater than the 105 tons per second carried by the great Amazon River. Flooding shaped the outflow channels approximately 3 billion years ago, about the same time as the northern volcanic plains formed.

(A) Option A
(B) Option B
(C) Option C
(D) Option D

14. Directions: an introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the Three answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points. Write your answer choices in the spaces where they belong. You can either write the letter of your answer choice or you can copy the sentence.

There is much debate concerning whether Mars once had water.

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Answer Choices

(A) Various types of images have been used to demonstrate that most of the Martian surface contains evidence of flowing water.
(B) The runoff and outflow channels of Mars apparently carried a higher volume of water and formed more extensive networks than do Earth's river systems.
(C) Mars' runoff and outflow channels are large-scale, distinctive features that suggest that large quantities of liquid water once flowed on Mars.
(D) Although some researchers claim that Mars may once have had oceans, others dispute this, pointing to an absence of evidence or offering alternative interpretations of evidence.
(E) While numerous gullies have been discovered on Mars since 2000, many astronomers dismiss them as evidence that Mars once had liquid water.
(F) There is very little evidence of liquid water on Mars today, and it is assumed that all the water that once existed on the planet is frozen beneath its surface.