Reading Comprehension

INSPIRUS®
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Reading Comprehension

Passage 1

For each of questions 1 to 12, select one answer choice unless otherwise instructed.
Questions 1 to 7 are based on the following reading passage.

(This passage is excerpted from an article that was published in 1981)

The deep sea typically has a sparse fauna dominated by tiny worms and crustaceans, with an even sparser distribution of larger animals. However, near hydrothermal vents, areas of the ocean where warm water emerges from subterranean sources, live remarkable densities of huge clams, blind crabs, and fish.

Most deep-sea faunas rely for food on particulate matter, ultimately derived from photosynthesis, falling from above. The food supplies necessary to sustain the large vent communities, however, must be many times the ordinary fallout. The first reports describing vent faunas proposed two possible sources of nutrition: bacterial chemosynthesis, production of food by bacteria using energy derived from chemical changes, and advection, the drifting of food materials from surrounding regions. Later, evidence in support of the idea of intense local chemosynthesis was accumulated: hydrogen sulfide was found in vent water; many vent-site bacteria were found to be capable of chemosynthesis; and extremely large concentrations of bacteria were found in samples of vent water thought to be pure. This final observation seemed decisive. If such astonishing concentrations of bacteria were typical of vent outflow, then food within the vent would dwarf any contribution from advection. Hence, the widely quoted conclusion was reached that bacterial chemosynthesis provides the foundation for hydrothermal-vent food chains-an exciting prospect because no other communities on Earth are independent of photosynthesis.

There are, however, certain difficulties with this interpretation. For example, some of the large sedentary organisms associated with vents are also found at ordinary deep-sea temperatures many meters from the nearest hydrothermal sources. This suggests that bacterial chemosynthesis is not a sufficient source of nutrition for these creatures. Another difficulty is that similarly dense populations of large deep-sea animals have been found in the proximity of "smokers" –vents where water emerges at temperatures up to 350°C. No bacteria can survive such heat, and no bacteria were found there. Unless smokers are consistently located near more hospitable warm-water vents, chemosynthesis can account for only a fraction of the vent faunas. It is conceivable, however, that these large, sedentary organisms do in fact feed on bacteria that grow in warm-water vents, rise in the vent water, and then rain in peripheral areas to nourish animals living some distance from the warm-water vents.

Nonetheless, advection is a more likely alternative food source. Research has demonstrated that advective flow, which originates near the surface of the ocean where suspended particulate matter accumulates, transports some of that matter and water to the vents. Estimates suggest that for every cubic meter of vent discharge, 350 milligrams of particulate organic material would be advected into the vent area. Thus, for an average-sized vent, advection could provide more than 30 kilograms of potential food per day. In addition, it is likely that small live animals in the advected water might be killed or stunned by thermal and/or chemical shock, thereby contributing to the food supply of vents.

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1. The primary purpose of the passage is to
   A. describe a previously unknown natural phenomenon
   B. reconstruct the evolution of a natural phenomenon
   C. establish unequivocally the accuracy of a hypothesis
   D. survey explanations for a natural phenomenon and determine which is best supported by evidence
   E. entertain criticism of the author's research and provide an effective response

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2. The passage provides information for answering which of the following questions?
   A. What causes warm-water vents to form?
   B. Do vent faunas consume more than do deep-sea faunas of similar size?
   C. Do bacteria live in the vent water of smokers?
   D. What role does hydrogen sulfide play in chemosynthesis?
   E. What accounts for the locations of deep-sea smokers?

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3. The information in the passage suggests that the majority of deep-sea faunas that live in nonvent habitats have which of the following characteristics?
   A. They do not normally feed on particles of food in the water.
   B. They are smaller than many vent faunas.
   C. They are predators.
   D. They derive nutrition from a chemosynthetic food source.
   E. They congregate around a single main food source.

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4. Which of the following does the author cite as a weakness in the argument that bacterial chemosynthesis provides the foundation for the food chains at deep-sea vents?
   A. Vents are colonized by some of the same animals found in other areas of the ocean floor.
   B. Vent water does not contain sufficient quantities of hydrogen sulfide.
   C. Bacteria cannot produce large quantities of food quickly enough.
   D. Large concentrations of minerals are found in vent water.
   E. Some bacteria found in the vents are incapable of chemosynthesis.

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For the following question, consider each of the choices separately and select all that apply.

5. Which of the following is information supplied in the passage that would support the statement that the food supplies necessary to sustain vent communities must be many times that of ordinary fallout?
   A. Large vent faunas move from vent to vent in search of food.
   B. Vent faunas are not able to consume food produced by photosynthesis
   C. Vents are more densely populated than are other deep-sea areas.

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6. The author refers to “smokers” in the third paragraph most probably in order to
   A. show how thermal shock can provide food for some vent faunas by stunning small animals
   B. prove that the habitat of most deep-sea animals is limited to warm-water vents
   C. explain how bacteria carry out chemosynthesis
   D. demonstrate how advection compensates for the lack of food sources on the seafloor
   E. present evidence that bacterial chemosynthesis may be an inadequate source of food for some vent faunas

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7. Which of the following can be inferred from the passage about the particulate matter that is carried down from the surface of the ocean?
   A. It is the basis of bacterial chemosynthesis in the vents.
   B. It may provide an important source of nutrition for vent faunas.
   C. It may cause the internal temperature of the vents to change significantly.
   D. It is transported as large aggregates of particles.
   E. It contains hydrogen sulfide.

Reading Comprehension

Passage 2

Frazier and Mosteller assert that medical research could be improved by a move toward larger, simpler clinical trials of medical treatments. Currently, researchers collect far more background information on patients than is strictly required for their trials — substantially more than hospitals collect — thereby escalating costs of data collection, storage, and analysis. Although limiting information collection could increase the risk that researchers will overlook facts relevant to a study, Frazier and Mosteller contend that such risk, never entirely eliminable from research, would still be small in most studies. Only in research on entirely new treatments are new and unexpected variables likely to arise.

Frazier and Mosteller propose not only that researchers limit data collection on individual patients but also that researchers enroll more patients in clinical trials, thereby obtaining a more representative sample of the total population with the disease under study. Often researchers restrict study participation to patients who have no ailments besides those being studied. A treatment judged successful under these ideal conditions can then be evaluated under normal conditions. Broadening the range of trial participants, Frazier and Mosteller suggest, would enable researchers to evaluate a treatment's efficacy for diverse patients under various conditions and to evaluate its effectiveness for different patient subgroups. For example, the value of a treatment for a progressive disease may vary according to a patient's stage of disease. Patients' ages may also affect a treatment's efficacy.

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8. The passage is primarily concerned with

A. identifying two practices in medical research that may affect the accuracy of clinical trials
B. describing aspects of medical research that tend to drive up costs
C. evaluating an analysis of certain shortcomings of current medical research practices
D. describing proposed changes to the ways in which clinical trials are conducted
E. explaining how medical researchers have traditionally conducted clinical trials and how such trials are likely to change

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9. Which of the following can be inferred from the passage about a study of the category of patients referred to in lines ….?

   [Often researchers restrict study participation to patients who have no ailments besides those being studied.]

A. Its findings might have limited applicability.
B. It would be prohibitively expensive in its attempt to create ideal conditions.
C. It would be the best way to sample the total population of potential patients.
D. It would allow researchers to limit information collection without increasing the risk that important variables could be overlooked.
E. Its findings would be more accurate if it concerned treatments for a progressive disease than if it concerned treatments for a nonprogressive disease.

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10. It can be inferred from the passage that a study limited to patients like those mentioned in lines …. would have which of the following advantages over the kind of study proposed by Frazier and Mosteller?

    [Often researchers restrict study participation to patients who have no ailments besides those being studied.]

A. It would yield more data and its findings would be more accurate.
B. It would cost less in the long term, though it would be more expensive in its initial stages.
C. It would limit the number of variables researchers would need to consider when evaluating the treatment under study.
D. It would help researchers to identify subgroups of patients with secondary conditions that might also be treatable.
E. It would enable researchers to assess the value of an experimental treatment for the average patient.

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11. The author mentions patients' ages (line …) primarily in order to

A. identify the most critical variable differentiating subgroups of patients
B. cast doubt on the advisability of implementing Frazier and Mosteller's proposals about medical research
C. indicate why progressive diseases may require different treatments at different stages
D. illustrate a point about the value of enrolling a wide range of patients in clinical trials
E. substantiate an argument about the problems inherent in enrolling large numbers of patients in clinical trials

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12. According to the passage, which of the following describes a result of the way in which researchers generally conduct clinical trials?

A. They expend resources on the storage of information likely to be irrelevant to the study they are conducting.
B. They sometimes compromise the accuracy of their findings bycollecting and analyzing more information than is strictly required for their trials.
C. They avoid the risk of overlooking variables that might affect their findings, even though doing so raises their research costs.
D. Because they attempt to analyze too much information, they overlook facts that could emerge as relevant to their studies.
E. In order to approximate the conditions typical of medical treatment, they base their methods of information collection on those used by hospitals.

Thank you