The Great Barrier Reef

A reef is a chain of rocks or coral that is near the surface of the ocean. Coral is a rock-like substance that is produced by sea animals. It often has bright colors which make it very beautiful. Reefs are a vital part of the ocean ecosystem. The largest such reef is just off the north eastern coast of Australia. This ***area*** is called "The Great Barrier Reef."

Approximately 900 islands and more than 3,000 smaller reefs make up The Great Barrier Reef system. It acts as a home for many different kinds of marine life, from tiny plants and fish to large sharks. The hard edges of the reef protect the marine life within from the strong waves of the ocean. Some notable species that depend on the reef include green sea turtles and the humpback whale, which travel from the Antarctic to give birth to their calves in the warm reef waters. Because of its importance as a diverse marine ecosystem, the Great Barrier Reef has been included on the list of World Heritage Areas. The coral in the reef is also important for ***maintaining*** the proper pH level in the water. The pH is a measure of the chemical balance of the water. With an incorrect pH level, plants and fish cannot survive. Thus , the coral not only protects the marine life from strong waves, but it also makes the water suitable for the animal life inhabiting it.

Recently, The Great Barrier Reef has been suffering damage. Global warming has been increasing ocean water temperatures past the level conducive to coral life. In addition, runoff from local farmland has been polluting the ocean water around the reef, and, by extension, the marine life within it. To compound this problem, this tarnished water is believed to be beneficial to the Crown-of-Thorns starfish, a species that actually preys upon coral. As more and more of these starfish are able to reproduce, more and more of The Great Barrier Reef will be destroyed.

1. According to the passage , where are reefs usually located?
    a. Deep underwater
    b. In lakes and rivers
    c. In the middle of the ocean
    d. Near the surface of the ocean

2. According to paragraph 2 , how does the Barrier Reef protect marine life?
    a. The fish generally do not eat the plants in the reef
    b. It provides polluted runoff

c. The reef is hard and protects the plants and fish from large waves

d. It protects marine life from the Crown-of-Thorns starfish

3. Which of the following is closest in meaning to "**area**" in paragraph 1?
   a. Land beside the sea
   b. Location
   c. City
   d. Ocean

4. As used in paragraph 2, what is the meaning of the word "**maintain**"?
   a. Keeping
   b. Exercising
   c. Getting rid of
   d. Multiplying

5. **Directions:** *Complete the table by matching the phrases below Select the appropriate phrases from the answer choices and match them to the aspect of reefs to which they relate TWO of the answer choices will NOT be used .*

Benefit	**Problem**
_____	_____
_____	_____
	_____

   a. Warmer temperature of water
   b. Pollution from farmlands
   c. Protection for marine life from strong waves
   d. Keeps pH levels in the water
   e. Location is off the northeastern coast
   f. Many sharks in area
   g. Good environment for a type of starfish

Seasonal Lag

Europe, North America, and most of Asia are all located in the Earth's Northern Hemisphere. The longest day of the year, called the summer solstice, falls on June 22nd in the Northern Hemisphere. On this day, the sun is almost directly overhead. However, June is not the hottest month of the year in the Northern Hemispher. In fact, August is hotter than June. In terms of heat energy from the sun reaching the Earth, May, June, and July should be the three warmest months. However, in the Northern Hemisphere, this is not the case. June, July, and August are actually the three warmest. The reason for this can be easily understood by exarnining the phenomenon of seasonal lag.

Normally, the heat received by the Earth from the sun is lost through the atmosphere into space. However, as the Northern Hemisphere tilts towards the sun in the spring, it receives the sunlight at a more direct angle and therefore gains heat faster than it loses it. This part of the Earth receives the greatest amount of heat energy from the sun on June 22nd, but, for the more northern areas in particular, the ***maximum*** warmth is reached in late July. In fact, heat gain continues to be greater than heat loss until the end of August. During August, the rate of heat gain discussed day by day. As August passes, this area starts to lose heat faster than it receives it. The Northern Hemisphere then continues to cool until springtime.

The ***process*** is like starting a fire in a stove. The room is slowly heated by the fire. After the fire goes out , the room stays warm for a while. Because the room is not being heated any longer, as more and more heat escapes from the room, the room begins to cool. This same heat lag also explains why the warmest part of the day is around 3 p.m. and not at noon, when the Earth receives the sun's rays most directly. The heat has built up throughout the day as the Earth has received the sun's energy.

Seasonal lag also occurs during the winter months. Although the Northern Hemisphere receives the least amount of direct sunlight on the winter solstice, December 21st, its coldest temperatures are measured in January and February rather than in December. Interesting, in regions closer to the equator, seasonal lag becomes less noticeable. In lands lying directly on the equator, in fact, seasonal lag does not occur at all. Because the Earth's angle to the sun remains constant all year, these lands receive the same amount of direct sunlight every day in every season.

1. It can be inferred from the passage that
    a. June 22nd is normally the hottest day of the year
    b. temperatures in North America change rapidly
    c. fire causes seasonal lag
    d. the Northern Hemisphere is cooler at the end of August than at the beginning

2. What can be inferred from paragraph 2 about heat loss and gain?
    a. It is greater in the Northern Hemisphere than in the Southern Hemisphere
    b. It depends on the weather during a particular year
    c. It depends on the tilt of the Earth
    d. It is hottest on June 22

3. As used in paragraph 2, what is the meaning of the word "**maximum**"?
    a. Entire
    b. Fastest
    c. Greatest
    d. Most direct

4. The word "**process**" in paragraph 3 is closest in meaning to
    a. a series of actions
    b. to make
    c. task
    d. fire

5. **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.*

    First sentence: **Though the Northern Hemisphere receives most of its heat from the sun in June, July and August are hotter months.**

    a. North America is in the Earth's Northern Hemisphere .
    b. The northern part of the Earth angles towards the sun in the spring
    c. From spring through August , the Northern Hemisphere gains heat faster than it loses heat
    d. The warmest part of the day is around 3 p.m
    e. The heat gained in May and June builds up and is released in July and August
    f. On June 22nd , the sun is almost directly overhead