READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13** which are based on Reading Passage 1 below.

Hot Springs on the Ocean Floor

In many areas of the ocean floor, wherever magma nears the seafloor, or where lava erupts directly at the seafloor surface, hot springs on the seafloor called hydrothermal vents commonly are found. Vent fields are generally associated with submarine volcanoes where lava is erupting or preparing to erupt. Hydrothermal vents also are found in areas of the ocean floor that are spreading, such as at raid-ocean ridges, where tectonic plates are being pulled apart. This movement allows the molten magma to rise from deep inside the Earth, superheating the cold ocean water around it. The average temperature of deep-ocean water is only (36°F). The water coming directly from a hydrothermal vent can reach up to 350 °C (662 °F) and is rich in dissolved chemicals. The hot spring water forms a plume above the vent, somewhat like smoke ;; rising from a chimney into the air. Temperature-sensing" instruments, towed behind research vessels , can detect these hot-|| water plumes and aid oceanographers in locating hydrothermal jj vents on the ocean floor.

Vent Circulation and Chemistry Seafloor hydrothermal systems influence local ocean chemistry because hydrothermal circulation removes some chemical compounds from sea water, such as magnesium and sulfate, and adds many others . Further, the circulation pattern of sea water within the hydrothermal vent system creates the unique landforms and it biological communities found invent fields Sea water enters into the seafloor by seeing down through fracture systems. As water percolates through the cracks, it heats as it nears the magma chamber. Subsurface water can heat to 60 (140 *F), warm enough to begin dissolving chemicals and minerals from the surrounding rock. The water becomes rich in chemical compounds of sulfur, iron, and magnesium. When this vent fluid comes close to the magma chamber, it enters a high temperature reaction zone where temperatures rise to 400°C i (752'f) . This superheated, high ressure, mineral-laden vent fluid rises forcefully, searching for fracture systems or other openings to the ocean floor. Black smokers form when hot vent water mixes with cold sea water, causing the precipitation of tiny particles of manganese-rich and iron-rich sulfide minerals. White smokers form from slightly cooler vent water and the precipitation of minerals rich in barium and calcium. Vent openings can be as small as several " centimeters or as large as a meter or more in diameter. At these }{ openings, the vent fluid becomes focused and expels forcefully [into the surrounding cold sea water. At this point, the temperature of the vent fluid varies around 350RC (662°f) . The reaction between the two waters of differing temperature causes some of the dissolved minerals to precipitate out, forming tiny grains in the vent fluid. The particles give the fluid the appearance of a dark cloud. Because a large percentage of the chemical compounds are sulfides, such as hydrogen sulfide, the vent fluid is highly toxic, with a PH near 4.0, or about that of vinegar. As the vent fluid rises, it slows and begins to mix with the surrounding ocean water, producing a plume of warm water that starts to drift with the currents. The plume tends to hang together as it cools, aiding in its detection. Many of the i! chemical and mineral compounds begin to drop from the plume, forming metalliferous sediments and iron and manganese crusts on jj the nearby ocean floor. Because deposits from hydrothermal vent fluid can contain iron, manganese, copper, zinc, and other minerals, vents have relevance to certain types of ore deposits.

Chemosynthesis The chemicals in hydrothermal vent fluid would be toxic to most forms of life familiar to humans; but amazingly, a unique ecosystem has evolved to live near hydrothermal vents. The organisms that are supported by the vents rely on microbes, similar to colonies of bacteria, which grow in the vent fluid andn the surface of the surrounding rocks and chimneys . The ability of microbes to create a food source from otherwise toxic chemicals provides for animal species that biologists are just

Tubeworms beginning to understand. Because each species can tolerate certain levels of heat and toxicity, the communities form concentric rings around hydrothermal vents with each species existing in its preferred habitat. Animals also are categorized as vent and non-vent species. Some are directly dependent on the vents for survival while others can migrate between vents and the open ocean. Tubeworms are one of the most common and distinctive animals found at hydrothermal vents. Tubeworms attach themselves ; to the seafloor and have no mouth or anus, a notable trait found extremely amazing. Instead, they have symbiotic microbes living inside them. Tubeworms live in colonies consisting of hundreds to many thousands of individuals, with many other smaller vent species living among them. The colonies form mounds of long, white stalks topped with red, branching filaments. Numerous species of clams are found near the vents, siphoning the warm water to digest plume microbes and detritus (decaying matter) dropping from above. Gastropods such as limpets and snails move about the rocks, rasping the mat-forming microbes with their radulas. Other species of annelid worms and sea cucumbers also feed from the mat^orming microbes. Species of crabs and arthropods scrape away at the microbes as well as prey on the sedentary and slow-moving species. Some fish prefer the vent fields and can tolerate the high heat and toxins, whereas others roam between the vents in search of food. Rarely, a small gray octopus will swim by. Termed Bentosoctopus, it is very reclusive and not much is known about the species .

Colonization When hydrothermal vents begin to develop, animal communities colonize the vents with a set progression. Plume and mat-forming microbes begin to grow almost immediately. Within a few months, fast-colonizing animals, such as tubeworms, scale worms, snails, and limpets begin to colonize hydrothermal vents . Newly colonized vents typically have few species and few individuals, and if tubeworms are present, they are white and small (generally less than 50 centimeters long, or 19.5 inches) . Older, established vents have more species and more animals, and the tubeworms are brown and larger (usually more than 50 centimeters long) . Some sessile (nonmobile) and slow-colonizing animals like sponges, sea fans, and crinoids are mostly found on older lava away from active hydrothermal areas. They are sparsely distributed and colonize new lava flows and vents very slowly, often taking many years. Some species of octopus, crab, and fish are mobile and can move freely from one site to another, and can be found near either old or new lava. Hydrothermal vents do not remain active forever. Inevitably, the underground magma will cool. Vents begin to cool and go dormant. The nonsessile animals have the ability to migrate to other active vent fields. But. those species chat are attached or move too slowly will perish as their heat and food source slowly dies out.

Questions 1-4

Choose the appropriate letters **A-D** and write them in boxes **1-4** on your answer sheet.

1 Which of the following is true of hydrothermal vents?

A Their numbers have been increasing.
B They exist in large numbers on the ocean floor.
C They were detected for the first time by research vessels.
D Only submarine volcanoes cause them.

2 What supports animal lives around vents?

A Bacteria.
B Food created from poisonous chemicals.
C Their ability tolerate heat and toxicity.
D Migration between vents and the open ocean.

3 What features of tubeworms are found intriguing?

A They live in a toxic environment.
B They have no mouth or anus.
C They attach themselves to the seafloor.
D They form colonies.

4 Which of the following species is NOT mentioned in the text to feed on microbes?

A Limpets. **B** Annelid worms.
C Crabs and arthropods. **D** Bentosoctopus.

Questions 5-8

The diagram below is based on the Vent Circulation and Chemistry part of the passage.

Choose **NO MORE THAN THREE WORDS** from the passage for each answer. Write your answers in boxes 5-8 on your answer sheet.

Water enters the……**5**…….. and heals to 601

⇩

……**6** ……..…… in nearby rocks dissolve into water

⇩

Water approaches magma chamber and heats to 400

⇩

High-pressured mineral-rich water erupts at ……. **7**……..

⇩

Fluid slows as it rises

⇩

Mineral compounds drop to form…..…**8**……

Questions 9-13 Complete the summary below. Choose your answers from the passage.
Use **NO MORE THEN THREE WORDS** far each answer and write them in boxes **9-13** on your answer sheet.

The development of animal communities often follows certain procedures. Mat-forming microbes are among the first to ___**9**_____ the vents. _____**10**_____ tube worms are often found around newly colonized vents while _____**11**_____typically have larger ones with a darker colour. ____**12**_____ such as sponges and sea fans spread very slowly. Animals like __**13**_____ can be found al both old and new vents because they can swim at will between different sites, so unlike sessile ones ihey do not die out as the hydrothennal vents eventually deplete.

READING PASSAGE 2 You should spend about 20 minutes on **Questions 14 - 27** which are based on Reading Passage 2 below.

Questions 14-18 Heading Passage 2 has **9 paragraphs A- I.** From the list of headings below choose the 5 most suitable headings for paragraphs **C, E, F, G,** and **H**. Write the appropriate numbers **(i —x).**

NB *There are more headings than paragraphs, so you will not use them all.*

List of Headings

i "Virtual" libraries on the horizon
ii The problem of lucid reading
iii The success of electronic encyclopedias
iv Early setbacks in electronic publishing
v Problems solved with the advent of the World Wide Web
vi Improved readability
vii Unrestrained reading experience
viii Easy deliver)' and mass storage capacities
ix Milestones in reading "technology" evolution
x Accessing Library of Congress made possible

Example	**Answer**
Paragraph A	ix

14. Paragraph C
15. Paragraph E
16. Paragraph F
17. Paragraph G
18. Paragraph H

E-Book----------

A. Reading on paper is so much a part of our lives that it is hard to imagine anything could ever replace inky marks on shredded trees. Since Johannes Gutenberg invented an economical way to make movable metal type in the 15th century, making it possible to produce reading matter quickly, comparatively cheaply and in large quantities, the printed word has proved amazingly resilient, So how could anyone believe that sales of electronic books will equal those of paper books within a decade or so? First, it is worth remembering that paper is only the latest in a long line of reading "technologies" that were made obsolete each time an improved solution emerged. Pictures drawn on rock gave way to clay tablets with cuneiform characters pressed into the clay before it dried. Clay gave way to animal skin scrolls marked with text, and then to papyrus scrolls. By AD 100 the codex had arrived, but it was not until the ninth century that the first real paper book was produced. In Europe, paper was rare until after Gutenberg's breakthrough,

B. It took a few more centuries for e-books to emerge. They were first envisioned in 1945 by Vannevar Bush, director of the United States Office of Scientific Research and Development. In his classic essay, "As We May Think", Bush described a gadget he called a "Memex"—"a device in which an individual stores all his books, records, and communications. Most of the memex contents are purchased on microfilm ready for insertion. Books of all sorts, pictures, current periodicals, newspapers, are thus obtained and dropped into place. Wholly new forms of encyclopedias will appear, ready-made with a mesh of associative trails running through them,"

C. Although science-fiction writers eagerly adopted Bush's ideas notably on the television show Star Trek, where portable electronic books featured regularly, the real world has remained loyal to paper. Only in the encyclopedia market, which was transformed by CD-roms in the mid-1980s, has the e-book made real progress. Far more encyclopedias, from Microsoft's Encarta to Encyclopedia Brttannica, are sold on CD-rom than were ever sold on paper, because they cost a fraction of the price and are easier to search. But attempts to broaden the appeal of e-book technology to appeal to readers have been unsuccessful. Since the late 1980s the electronic publishing world has seen several failed e-book ventures. Why? Most of them used devices that were either too bulky to carry around, or forced users to "stock up" their electronic library In inconvenient ways. One even required visits to a " book bank", an ATM-like machine that was to be located in bookstores. Before widespread adoption of the Internet, there was no universal way to download new reading material.

D. But the most fundamental problem was the lack of a display technology that could compete with paper when it came to lucid reading. For paper books, readability depends on many factors; typeface and size, line length and spacing, page and margin size, and the colour of print and paper, But for e-books there are even more factors, including resolution, flicker, luminance, contrast and glare. Most typefaces were not designed for screens and, thanks to a limited number of pixels, are just fuzzy reproductions of the originals. The result is that reading on screen is hard on the eyes and takes a lot more effort. People do it only for short documents. The longer the read, the more irritating and distracting are all the faults in display, layout and rendering.

E. Most of these problems are now being solved. The World Wide Web offers an amazingly flexible way to deliver books and as investments in broadband infrastructure increase, it will get even easier to stock an e-library. And dozens of companies established publishing firms such as R. R. Donnelly, Penguin Putnam, and Nokia. Barnes & Noble and Microsoft have joined to create an open e-book standard, so that book-lovers will be able to read any title on any e-book. There have also been some incredible technological breakthroughs that will make it much easier to read long texts on a screen. Microsoft has developed a font display technology called Clear Type that, by manipulating the red, green and blue sub-pixels that make up the pixels on an LCD screen, improves resolution by up to a factor of three. Coupled with the latest e-book reading software and hardware, this provides an on-screen reading experience that begins to rival paper.

F. But why would anyone prefer an e-book to a p-book, regardless of improved readability? Because e-books have many other advantages. You will get instant delivery from your web bookshop to your e-book, and be able to store hundreds of novels on a device the size of a paperback. E-book technology enables you to have an entire library in your pocket. Or you can keep it on your PCs—a modern laptop can hold more than 30,000 books. You won' t have to wait for out-of-stock books to be ordered, and books will never go out of "print". Your children wiil be able to listen to unfamiliar words pronounced for them as they read. You will have unabridged audio synchronized to the text, so you can continue the story in Situations where you are unable to read, for example, while driving.

G. In addition, e-books promise to revolutionize the way the world reads. Whereas paper books are stand-alone entities, e-books can Include hypertext links to additional content, whether it is in other books, databases or web sites. So e-books will not be restricted to a linear structure that is the same for every one. Every reader will be free to make use of the links, images and sounds differently. You will also be able to customize e-books by adding your own notes, links and images, In a paper book, content is fixed; with e-book technology it is flexible.

H. The e-book will also revolutionize the economics of the industry. The cost of publishing' books will fall dramatically, the result of savings on materials, labour, manufacturing and distribution, In the process, a lot of trees will also be saved and even the most obscure author will be able to self-publish, which means more choice for readers. The retail price of books wilt fall; sales will explode.

I. It is hard to imagine today, but one of the greatest contributions of e-books may eventually be in improving literacy and education in less-developed countries. Today people in poor countries cannot afford to buy books and rarely have access to a library. But in a few years, as the cost of hardware continues to decline, it will be possible to set up "virtual" public libraries which will have access to the same content as the Library of Congress.

Questions 19-23

Classify the following statements as applying to

A. 1980s e-book devices **B.** Memex **C.** Movable metal type
D. Clear Type **E.** Animal skin scroll

19. stores contents on readymade microfilms.
20. is a more improved solution than clay tablets.
21. facilitated the mass production of books in Europe.
22. are not easily portable.
23. improves resolution quality almost equal to books.

Questions 24-27

Complete the sentences below with words taken from the reading passage. Use **NO MORE THAN THREE WORDS** for each blank. Write your answers in boxes **24-27** on your answer sheet.

24 joins forces with Microsoft to develop e-book standards.
25 E-books allow users to listen to read simultaneously with the text.
26 can be added to e-books to guide readers to additional content.
27 Ordinary people will be free to publish their own e-books, giving readers

READING PASSAGE 3

You should spend about 20 minutes on **Questions 28 - 40** which are based on Reading Passage 3 below.

Optimism:- The Key To A Good Life

It's an age-old battle. Pessimists think optimists are foolish; optimists think pessimists make themselves unnecessarily miserable. A lot of research has been done on this issue in the last 30 years. Have we answered the question yet? Is the glass half-full or half-empty?

Optimistic people are happier than pessimists. When something bad happens, optimists think of it as temporary, limited in its effect, and not entirely their fault. Pessimists do the opposite. They consider the setback to be permanent, far-reaching and their entire fault. There are varying degrees of this, of course; it's not black or white. Most people fall somewhere between the two extremes. The main difference between optimists and pessimists is how they explain setbacks to themselves. Optimism and pessimism both tend to be self-fulfilling prophecies. Pessimistic explanations tend to make people feel defeated—making them less likely to take constructive action. Optimistic explanations, on the other hand, make people more likely to act. If they think the setback is only temporary, people are apt to try to do something about it, and because they take action, they make it temporary. Using these definitions, researchers find that optimism contributes to good health and pessimism contributes to illness.

Chris Peterson was teaching a class in abnormal psychology at Virginia Tech. when he told his students to fill out an Attributional Style Questionnaire—a carefully designed test that determines a person's level of optimism and pessimism. The students also answered questions about their general health, including how often they went to a doctor. Peterson followed the health of his students the following year and discovered that the pessimists had twice as many infectious diseases and made twice as many trips to the doctor as the optimists. Later, Martin Seligman of the University of Pennsylvania and two of his colleagues, using interviews and blood tests, found that optimists have better immune activity than pessimists. The study shows that university freshmen who participated in a workshop on cognitive coping skills reported fewer adverse physical problems and took a more active role in maintaining their health.

In the study, incoming freshmen were asked to complete a questionnaire designed to reflect their overall attitudes and coping behaviors. Seligman and Buchanan invited those students identified as the most pessimistic to participate in the study. Students were randomly assigned to attend either the 16-hour workshop or a control group. Workshop participants learned to dispute their chronic negative thoughts as well as learned social and work skills that can help avert depression. After an 18-month follow-up, the preliminary findings showed that 22 percent of the workshop participants had suffered moderate or severe depression by blind clinical diagnosis, compared with 32 percent of the control group subjects. Also, only 7 percent of the workshop participants suffered from a moderate or severe anxiety disorder, compared with 15 percent of the control group. Workshop participants also reported fewer health problems during the course of the workshop, and were more likely than control subjects to see a physician for maintenance or checkups rather than wait until they became ill. While the subjects were young and generally healthy, Buchanan speculated the study could be replicated using older more vulnerable subjects.

Studies by other researchers show the same thing. Why? One big factor is that " pessimistic individuals," as Seligman writes, "get depressed more easily and more often. " When a person is depressed, certain brain hormones become depleted, creating a chain of biochemical events that end up slowing down the activity of the immune system. For example, two key players in our immune systems are T cells and NK cells. T cells recognize invaders (like viruses) and make more copies of them to kill off the invaders. Pessimists' T cells don't multiply as quickly as optimists', allowing invaders to get the upper hand • and NK cells circulate in the blood and kill whatever they come across that they identify as alien (such as cancer cells). Pessimists' NK cells can identify alien entities, but they don't destroy them as well as the optimists' NK cells.

Optimists also look at information in more depth to find out what they can do about the risk factors. In a study by Lisa Aspinwall, PhD, at the University of Maryland, subjects read health-related information on cancer and other topics. She discovered that optimists spent more time than pessimists reading the severe risk material and they remembered more of it. " These are people," says Aspinwall, "who aren't sitting around wishing things were different. They believe in a better outcome, and that whatever

measures they take will help them to heal." In other words, instead of having their heads in the clouds, optimistic people look. They do more than look, they seek. They aren't afraid to look into the situation because they're optimistic. Thus, for yet another reason, optimists are likely to be healthier. And it is also true that the better their health, the easier it is for them to maintain an optimistic outlook. And every effort they make to keep an optimistic attitude will reward them with a stronger immune system. The best news is what research has shown repeatedly: anyone can become more optimistic with effort. Pessimists can learn to see the temporary aspects of setbacks. They can be more specific about the effects of it, they can learn to not take all the blame and they can learn to take credit for the good they do. All it takes is practice. Optimism is simply a way of thinking about good and bad; it's a cognitive skill anyone can learn. So, what about the age-old conflict'/ Is the glass half-full or half-empty? The best answer is that the glass is both half-full and half-empty, but you're much better off if you think of it as half-full. When bad happens; assume it won't last long, look to see what isn't affected, and don't indulge in self-blame. When good happens; consider its effects permanent, see how much of your life is affected, and look to see how much you can take credit for.

Questions 28-33
Do the following statements agree with the information given in Reading Passage 3? In boxes 28-33 on your answer sheet write

TRUE	if the statement is true.
FALSE	if the statement is false.
NOT GIVEN	if the information is not given in the passage.

28. Studies indicate that pessimists are unhealthy.
29. Students were assigned, according to their levels of pessimism, to attend a workshop or a control group respectively.
30. Control subjects are more reluctant to see doctors and waited for their situations to worsen.
31. Pessimists' NK cells have the same function and efficiency as optimists'.
32. Lisa Aspinwall discovered that optimists have better memory than pessimists.
33. People ought to see the glass as both half-full and half-empty.

Questions 34-37
Use the information in the passage to match the people **(listed A-D)** with opinions or deeds **(listed34-37)** below.
Write the appropriate letter **(A-D)** in boxes **34-37** on your answer sheet.

A. Chris Peterson
B. Lisa Aspinwall
C. Buchanan
D. Martin Seligman and colleagues

34. concludes that optimists are belter aware of their situations because of the more positive attitude they take.
35. conducted a one-year study.
36. invited university freshmen to participate in a cognitive coping skills workshop.
37. suggested conducting the study on older subjects.

Questions 38-40
Choose **NO MORE THAN THREE WORDS** from the passage to complete the summary below.

Studies have identified the mechanism by which pessimists get unhealthier as a biochemical chain reaction. Depression inhibits the secretion of **……38……** which in tum reduces the efficiency of **……39……** Although pessimists and optimists have T cells and NK cells alike, the formers' reproduce fewer T cells which detect and attack viruses. And their NK cells are less powerful in combating **……40……..,** making it possible for invaders to prevail.