Part One: Reading (Score: 11 /20)

Read the following selection in which the writer presents technological attempts to record unspoken words, and then answer the questions that follow.

The Silent Speaker

1 In space, no one can hear you scream. Use a cell phone on a crowded commuter train and everyone can.

2 Charles Jorgensen is working to solve both problems, using an uncanny technology called sub-vocal speech recognition. Jorgensen demonstrates it at his offices at NASA's Ames Research Laboratory in Mountain View, California. He attaches a set of electrodes to the skin of his throat and, without opening his mouth or uttering a sound, his words are recognized and begin appearing on a computer screen. The Ames lab has already used sub-vocal commands to drive a car around a virtual city in a computer simulation and to google the Web, using nothing but unuttered search terms and commands. Jorgensen sees abundant applications for his technology where audible speech is impossible: for astronauts, underwater Navy Seals, fighter pilots and emergency workers charging into loud, harsh environments.

3 When we speak aloud, we're forcing air past the larynx and tongue, sculpting words using the articulator muscles go into action regardless of whether air is sent past them or not. All **you** have to do is say the words to yourself, and you're sending weak electrical currents from your brain to the speech muscles. Jorgensen's trick is to record those signals (known as electro-grams), process them with statistical algorithms, and compare the output with prerecorded signal patterns of spoken words, phrases and commands. When there's a match, the unspoken turns into speech.

4 Jorgensen, who earned a Ph.D. in 1974 in mathematical psychology (it was known before as artificial intelligence), hit upon the idea for sub-vocal speech recognition after working on electromyographic interfaces for fighter pilots. "That work led **us** to ask, 'How small an electromagnetic current can we discriminate?' " says Jorgensen. The fact that nerves produce current has been known since 1884, when Emil Dubois-Reymond sliced open his hand and plunged his clenched fist into a saline solution, triggering a jump in an attached galvanometer.

5 Sub-vocal speech recognition still needs a lot of work before it can achieve consistent, accurate readings. Audible-speech-recognition software is now proficient enough to convert both "tom-ah-to" and "tom-ay-to" to "tomato." Under optimal conditions, normal speech-recognition software that works with sound is 95% accurate.

6 But sub-vocal recognition is dealing with electromyograms that are different for each speaker. Consistency can be thrown off just by the positioning of an electrode. To improve accuracy, researchers in this field are relying on statistical models that get better at pattern-matching the more times a subject "speaks" through the electrodes. But even then, there are lapses. At Cambridge Mellon University, researchers found that the same "speaker" with accuracy rate of 94% one day can see that rate drops to 48% a day later. Between two different speakers, **it** drops even more.

7 Carnegie Mellon researcher Tanja Schultz says one possible application is a "silent" cell phone that can detect and translate unuttered phrases like "I'm in a meeting" and "I'll call you later." Japan's NTT Docomo is working on a sub-vocal mobile phone operated by sensors worn on the fingers and thumb. A speaker grips his face, putting the sensors in contact with the cheekbone, upper lip and chin. So far, Docomo's system recognizes the five Japanese vowels 90% of the time.

8   Jorgensen sees the day when electromagnetic sensors will be woven into the fibers of turtlenecks or rescue workers' outfits. "As long as people have had machines and tools, they've been dependent on the physicality of the body," Jorgensen says. "Separate those control activities from the body, and **it** opens a whole new generation of interface, interactive design."

Questions

A. Answer each of the following questions in 1-4 sentences of your own.
 1. According to Jorgensen, what circumstances urge the use of sub-vocal speech recognition?
 (Score: 01)
 2. Identify the limitations that sub-vocal speech recognition still encounters.   **(Score: 01)**
 3. Find the difference between Jorgensen's technique and that of Tanja Schultz.   **(Score: 01)**
 4. In what sense is Jorgensen's technique "tricky"?   **(Score: 01)**

B. Scan Paragraphs 2, 3, 4, and 5 to fill in the following table with the function/contribution of each procedure/tool that Jorgensen uses in his work. Copy the table in your booklet, and use phrases.   **(Score: 01)**

Scientific Procedure/Tool	Function
1. a set of electrodes	
2. algorithms	
3. galvanometer	
4. audible-speech-recognition software	

C.
 1. Identify the thematic relationship between Paragraphs 1 and 2. Explain.   (**Score: 01**)
 2. Explain how the tone of Paragraph 8 serves the paragraph's function.   **(Score: 01)**
 3. How is the writer's scientific style revealed in the above selection? Justify.   **(Score: 01)**

D. Write a one-sentence summary of Paragraph 5.   **(Score: 01)**

E. What does each of the bold-faced pronouns refer to?   **(Score: 01)**
    1. **you** (Paragraph 3)   3. **it** (Paragraph 6)
    2. **us** (Paragraph 4)   4. **it** (Paragraph 8)

F. Find words in Paragraphs 2, 4, and 5 that almost have the same meanings as the following:
 (Score: 01)

    1. very strange and difficult to explain
    2. a flow of electric charges
    3. moved downward suddenly
    4. best possible

Part Two: Writing   **(Score: 09/20)**

Technology plays two contrasting roles with respect to human life and social relations. It has triggered a developmental revolution in scientific achievements and communication; however, it has weakened social ties and family relationships. **In an essay of 250-300 words, discuss the above statement, providing live examples to illustrate the two opposing roles of technology**. Make sure that, in your introduction, you put your reader in the general atmosphere of your topic and clearly provide a thesis statement, and that each of your body paragraphs starts with a topic sentence which you back up with relevant supporting details. Draft, revise, and proofread your essay. Your writing will be assessed for ideas, language and style, and tidiness.
(Score: 05 for ideas and organization, 03 for language and style, and 01 for tidiness and legible handwriting)

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الدورة الإستثنائية للعام 2012	امتحانات الشهادة الثانوية العامة فرع العلوم العامة و علوم الحياة	وزارة التربية والتعليم العالي المديرية العامة للتربية دائرة الامتحانات

الاسم: الرقم:	مسابقة في مادة اللغة الانكليزية المدة ساعتان ونصف	مشروع معيار التصحيح

Part of the Q	Answer Key	Mark
	Competencies: - Utilize reading strategies - Develop literal and interpretive comprehension of written discourse - Produce transactional writing	
I-A-1	It is used when audible speech is impossible, in cases where environments are rough and disturbing, or in space where sound is not heard.	**01**
I-A-2	Sub-vocal speech recognition still encounters many limitations. These limitations are inconsistency, inaccuracy, inability to convert all audible speeches into being audible, and differences in electromyograms for each speaker. **(0.25 for each limitation)**	**01**
I-A-3	Jorgensen relies on a technique known as sub-vocal speech recognition which deals with electromyograms and recognizes all words, while Schultz recommends a "silent" cell phone with limited capacity that can translate unuttered phrases. **(0.5 for each)**	**01**
I-A-4	Jorgensen benefited from the fact that the brain can produce weak electrical currents to articulator muscles even when the person says the words to himself. As a result, he developed a technique that can record and analyze the unspoken signals in order to convert them into speech.	**01**
B	**(0.25 for each)** <table><tr><th>Scientific Procedure/Tool</th><th>Function</th></tr><tr><td>1. a set of electrodes</td><td>helps in recognizing unspoken words</td></tr><tr><td>2. algorithms</td><td>process recorded electrical signals</td></tr><tr><td>3. galvanometer</td><td>measures nerve currents</td></tr><tr><td>4. audible-speech-recognition software</td><td>converts different sounds into one</td></tr></table>	**01**
I-C-1	Paragraph 1 presents two problems. The first has to do with inaudible speech (in space), while the second has to do with audible speech (on Earth). Paragraph 2 presents the technology (sub-vocal speech recognition) Jorgensen is developing in order to solve the two problems. So, the relation is that of problem-solution. **(0.25 for identification and 0.75 for explanation)**	**01**
I-C-2	The paragraph's function is to predict a future independence on physical activities as a positive step towards more progressive and developed field of interactive designs. The writer uses an optimistic/hopeful tone ("sees the day" and "opens a whole new generation") to reveal how promising his prediction is. **(0.5 for the function and 0.5 for the tone)**	**01**
I-C-3	The writer's scientific style is obvious in his straightforwardness, absence of emotionalism, logical and objective approaches of his topic in addition to his over whole reasoning. The writer directly states his topic and intellectually develops it. His reasoning is evident in the use of logic, in addition to the use of experiments and researches to make his final objective judgment.	**01**

D	Suggested Summary In paragraph 5 of "The Silent Speaker", the writer assures that though sub-vocal speech recognition is able to transform some different sounds/ pronunciations to corresponding words, it still needs more work to become precise.	**01**
I-E-1	the reader	**0.25**
I-E-2	Jorgensen and other scientists	**0.25**
I-E-3	the rate of accuracy	**0.25**
I-E-4	the act of separating	**0.25**
I-F-1	uncanny	**0.25**
I-F-2	current	**0.25**
I-F-3	plunged	**0.25**
I-F-4	optimal	**0.25**
II-A	Ideas and organization	**05**
II-B	Language and style	**03**
II-C	Tidiness and legible handwriting	**01**