

Reading Comprehension

Passage: 1

This sample text has been prepared for the Master of Electrical Engineering entrance exam by Alpha Consulting Group.

In experiments and even limited human clinical trials, electrode arrays implanted on the brain's surface have given monkeys and humans the ability to move objects with their thoughts. The experiments are proof that brain-computer interfaces could improve the lives of severely paralyzed people. But these systems rely on wires snaking out from the skull, which would affect a person's mobility and leave an opening in the scalp prone to infection. Wireless brain-machine interfaces would be much more practical and could be implanted in several different areas of the brain to tap into more neurons. A typical scheme would have electrodes penetrating brain tissue picking up neuronal electrical impulses, called spikes. A chip would amplify and process the signals and transmit them over a broadband RF connection through the skull to a receiver.

Then, just as in wired systems, algorithms would decode these signals into commands for operating a computer or a robot. The key requirement for such a system is that it should consume very little power to keep the heat down, "Most of the guidelines for implantable devices say that you should not raise the surrounding tissue temperature by more than 1°C; otherwise, you'll kill the cells you're trying to record from," says Reid Harrison. Sending the complex analog impulses as they are would take up so much bandwidth. So it will be necessary to convert them into a simpler, robust form as close as possible to that of the neuron, says Brown University neuro engineer Arto Nurmikko. He and some of his colleagues were associated with the now-defunct Foxborough, Mass., start-up Cyberkinetics Neuro technology Systems, which did the first human clinical trials of an implanted brain-computer interface.

Questions

1. Which is NOT mentioned as one of the problems with electrode arrays implanted on the brain skull?

- 1) The probability of infection.
- 2) The reduction of movement for target users.
- 3) The high financial consequences
- 4) The fact that many pieces of wires surround the target user

2. What are spikes?

- 1) Neuronal electrical impulses.
- 2) Specific kinds of brain tissue.
- 3) Electrodes which penetrate brain tissue.
- 4) A typical scheme.

3. If the temperature of the surrounding tissue heats up more than 1°C,.....

- 1) the patient will die.
- 2) too much heat will be wasted.
- 3) the targeted cells will die.
- 4) the experiment will fail

4. Which statement is correct according to the text?

- 1) Cyberkinetics Neurotechnology Systems is a company which exists in Massachuset.
- 2) Cyberkinetics Neurotechnology Systems is where the first human clinical trial of an implanted brain-computer interface was performed.
- 3) Arto Nurmikko is now working for Cyberkinestics Neurotechnology Systems.
- 4) Arto Nurmikko performed the first human clinical trials of an implanted of brain-computer interface.

Answers

1==>3

2==>1

3==>3

4==>2