1ª QUESTÃO **Valor: 3,0 (0,3 cada item)**

Leia o texto "**An amphibious robot**" e, **EM INGLÊS**, responda as perguntas sobre ele.

An amphibious robot

The robot is more than just lovable. With six rotating flippers, three on each side of its boxy metal carapace, this machine is amphibious, capable of both walking and swimming—an attribute that is unique in the robot world. As more onlookers gather, the little robot heads out through the surf and disappears into the turquoise waters that surround this Caribbean island.

The mechanical hexapod, called Aqua, is the latest in a series of seagoing robots our research group at McGill University, in Montreal, has been developing in collaboration with teams led by Michael Jenkin at York University, in Toronto, and Evangelos Milios at Dalhousie University, in Halifax, N.S., Canada. Our goal is to develop an underwater vehicle that can autonomously explore and collect data in aquatic environments while surviving the harsh saltwater conditions and often turbulent waters of the open sea. In building Aqua, we are tackling one of the most challenging topics in robotics: integrating vision and locomotion into an amphibious machine that can determine what it is "seeing," where it is, and where it is going.

But more than just providing an interesting engineering exercise, Aqua, we hope, will someday play an important role in protecting coral reefs. The most biologically diverse and sensitive components of the world's marine ecosystems, coral reefs are extremely fragile, and today they are in a state of crisis around the globe. Twenty percent of the world's reefs have already been destroyed, mainly as a result of human activity. The remaining reefs urgently require protection. As our preliminary experiments in Barbados showed, underwater robots such as Aqua could help conservationists monitor the health of reefs and thus be in a better position to protect them.

In the past 30 years, marine scientists have come to rely on underwater vehicles, or UVs, to probe ocean depths that before were largely inaccessible to humans. Often, these vehicles reveal details about the ocean that couldn't be obtained using data-gathering instruments deployed on ships or satellites. For instance, at the Massachusetts Institute of Technology, in Cambridge, the Deep Water Archaeology Research Group has been using a robotic UV to create precise photomosaics of under water archaeological sites. Also, researchers at the Scripps Institution of Oceanography, in La Jolla, Calif., and at the Woods Hole Oceanographic Institution, in Massachusetts, have been experimenting with ocean robots to gather

1ª QUESTÃO **Continuação**

data on hurricanes and marine life.

Unlike many earlier UVs, Aqua is intended for shallower waters, and its design reflects this. Although the majority of UVs are large and unwieldy—some require a crane to lower them into the water—Aqua measures only 50 by 65 by 13 centimeters and weighs just 18 kilograms. Aqua is thus easier to deploy: you can literally throw it into the water, or it can launch itself from the beach.

The robot is also incredibly maneuverable. Most UVs are propeller-driven, so the range of actions they can execute is fairly limited. Aqua's flippers move independently, enabling it to move forward, backward, up, down, and sideways; it can swim in a straight line or along a sinusoidal or helical path, and it can perform tight somersaults and rolls. Using six flippers instead of four also helps stabilize the robot when it's performing such tasks as recording video in rough waters.

Even though Aqua's compact size and amphibious locomotion make it ideal for operating around coral reefs, some of our collaborators have other ideas for the robot. They believe Aqua could serve as the basis for other robotic machines that could do environmental inspections in deep water or near shorelines; perform routine monitoring in aquaculture tanks used to raise sea creatures; and also help human divers with predive safety checks and physical tasks underwater.

(Adaptado de **IEEE Spectrum**, vol. 43, no. 6, June 2006)

1.1. What is the unique attribute presented by the amphibious robot?

1.2. What was the amphibious robot called?

1.3. Which educational institutions are involved in the research?

1.4. What is the objective of the research?

1.5. What is the challenging robotic topic this research intends to reach?

1.6. What future task will be destined the amphibious robot to accomplish?

1.7. What is one main difference between this amphibious robot and earlier ones?

1.8. How heavy is the amphibious robot?

1.9. When it comes to the movements the amphibious robot is able to do, why is it considered incredibly maneuverable?

1.10. Using the amphibious robot as a basis, what other tasks scientists and researchers think it can be used for?

2ª QUESTÃO — Valor: 2,0 (0,2 cada item)

Observe o 4º parágrafo do texto **"An amphibious robot"**. As palavras da coluna 2 foram retiradas deste parágrafo. Relacione-as com as palavras da coluna 1 conforme seu significado.

COLUNA 1	COLUNA 2
2.1. (___) investigate	**A.** rely
2.2. (___) for example	**B.** probe
2.3. (___) repeatedly	**C.** largely
2.4. (___) accurate	**D.** often
2.5. (___) places	**E.** deployed
2.6. (___) predominantly	**F.** for instance
2.7. (___) testing	**G.** precise
2.8. (___) collect	**H.** sites
2.9. (___) used effectively	**I.** experimenting
2.10. (___) count	**J.** gather

3ª QUESTÃO — Valor: 3,0 (0,3 cada item)

Leia o texto seguinte, retirado da Revista Geographical, de Fevereiro de 2006 e coloque entre parênteses (V), caso a afirmação sobre o texto seja verdadeira e (F), caso seja falsa.

How many aeroplanes are in the air at any one time?

The number of passengers taking flights grew by eight per cent between 2004 and 2005. And that's just people. Cargo transport is rising as more and more exotic fruit and vegetables are flown in for Western supermarkets. However, it isn't growing as quickly, racking up a mere 2.6 per cent rise over the past year, according to the International Air Traffic Association (IATA).

The rising cost of fuel means that growth has slowed in recent months. Even so, the IATA expects that over the next four years, growth in both passenger numbers and cargo will be around six per cent. Poland and China will see the biggest rises in aircraft use through to 2009.

3ª QUESTÃO **Continuação**

Although the IATA collects a lot of statistics on flights and passenger numbers, working out how many of the growing number of planes are in the sky at any one time is a tricky business, especially as statistics related to military and private aviation are more difficult to track down. Also, as the IATA tracks mainly passenger numbers and freight, deriving the average number of actual aeroplanes involves a little guesswork. According to the organisation, there are, on average, 400,000 people in the sky at any one time: equivalent to the population of Bristol. According to a spokeswoman at the IATA, there are about 100 people in each, giving an estimate of 4,000 planes in flight at any point during the day.

(**Geographical Magazine**, v78 i2, Feb 2006)

3.1. (___) Both passengers' flights and cargo transport are rising on these days.

3.2. (___) Western supermarkets import fruit and vegetables.

3.3. (___) Passenger's flights are growing slower then cargo transport.

3.4. (___) The price of fuel influences the number of aeroplanes in the air.

3.5. (___) A reduction on the price of fuel will enable the passenger numbers and cargo transport to grow around 6%.

3.6. (___) Once IATA collects statistics on flight and passenger numbers, calculating the number of planes in the sky becomes an easy task.

3.7. (___) Statistics related to military and private aviation are not so clear, what influences the prediction concerning how many aeroplanes are in the sky at any one time.

3.8. (___) Deriving the average number of actual aeroplanes is just a matter of guessing.

3.9. (___) The population of Bristol is so small that they can all travel on the same plane.

3.10. (___) According to the statistics, the answer to the question title of this text is 4,000.

4ª QUESTÃO **Valor: 2,0**

Leia o texto a seguir e traduza para o Português no CADERNO DE SOLUÇÕES.

Utopia, as described by Sir Thomas More, the man who originated the term in the early 16th century, is an imaginary place of few laws, great natural abundance, and an absence of poverty and want. We still don't know how to cure this. But in a western U.S. desert, a utopia of sorts is taking shape for broadband users who would like to get their phone, television, and Internet services from the providers of their choice.

As it turns out, this Utopia, known formally as the Utah Telecommunication Open Infrastructure Agency, promises to be just that, a broadband utopia. And it is very much a real place, encompassing 14 cities in northwestern Utah. It delivers to each of its 3000 subscribers high speed Internet access, telephony, and television programming through a fiber-optic cable at data rates that now reach 30 megabits per second.

(Adaptado de **IEEE Spectrum**, vol. 43, no. 5, May 2006)