

READING MOCK TEST 3

READING PASSAGE 1

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

Bamboo, a wonder plant

The wonder plant with an uncertain future: more than a billion people rely on bamboo for either their shelter or income, while many endangered species depend on it for their survival. Despite its apparent abundance, a new report says that species of bamboo may be under serious threat.

A Every year, during the rainy season, the mountain gorillas of Central Africa migrate to the foothills and lower slopes of the Virunga Mountains to graze on bamboo. For the 650 or so that remain in the wild, it's a vital food source. Although there are at almost 150 types of plant, as well as various insects and other invertebrates, bamboo accounts for up to 90 percent of their diet at this time of year. Without it, says Ian Redmond, chairman of the Ape Alliance, their chances of survival would be reduced significantly. Gorillas aren't the only locals keen on bamboo. For the people who live close to the Virungas, it's a valuable and versatile raw material used for building houses and making household items such as mats and baskets. But in the past 100 years or so, resources have come under increasing pressure as populations have exploded and large areas of bamboo forest have been cleared to make way for farms and commercial plantations.

B Sadly, this isn't an isolated story. All over the world, the ranges of many bamboo species appear to be shrinking, endangering the people and animals that depend upon them. But despite bamboo's importance, we know surprisingly little about it. A recent report published by the UN Environment Programme (UNEP) and the Inter-national Network for Bamboo and Rattan (INBAR) has revealed just how profound is our ignorance of global bamboo resources, particularly in relation to conservation. There are almost 1,600 recognized species of bamboo, but the report concentrated on the 1,200 or so woody varieties distinguished by the strong stems, or culms, that most people associate with this versatile plant. Of these, only 38 'priority species' identified for their commercial value have been the subject of any real scientific research, and this has focused mostly on matters relating to their viability as a commodity. This problem isn't confined to bamboo. Compared to the work carried out on animals, the science of assessing the conservation status of plants is still in its infancy. "People have only started looking hard at this during the past 10-15 years, and only now are they getting a handle on how to go about it systematically," says Dr. Valerie Kapos, one of the report's authors and a senior adviser in forest ecology and conservation to the UNEP.

C Bamboo is a type of grass. It comes in a wide variety of forms, ranging in height from 30 centimeters to more than 40 meters. It is also the world's fastest-growing woody plant; some species can grow more than a meter in a day. Bamboo's ecological role extends beyond providing food and habitat for animals. Bamboo tends to grow in stands made up of groups of individual plants that grow from root systems known as rhizomes. Its extensive rhizome systems, which tie in the top layers of the soil, are crucial in preventing soil erosion. And there is growing evidence that bamboo plays an important part in determining forest structure and dynamics. "Bamboo's pattern of mass flowering and mass death leaves behind large areas of dry biomass that attract wildfire," says Kapos. "When these burn, they create patches of open ground within the forest far bigger than would be left by a fallen tree." Patchiness helps to preserve diversity because certain plant species do better during the early stages of regeneration when there are gaps in the canopy.

D However, bamboo's most immediate significance lies in its economic value. Modern processing techniques mean that it can be used in a variety of ways, for example, as flooring and laminates. One of the fastest growing bamboo products is paper-25 percent of paper produced in India is made from bamboo fiber, and in Brazil, 100,000 hectares of bamboo are grown for its production. Of course, bamboo's main function has always been in domestic applications, and as a locally traded commodity it's worth about \$4.5 billion annually. Because of its versatility, flexibility and strength (its tensile strength compares to that of some steel),

it has traditionally been used in construction. Today, more than one billion people worldwide live in bamboo houses. Bamboo is often the only readily available raw material for people in many developing countries, says Chris Stapleton, a research associate at the Royal Botanic Gardens. "Bamboo can be harvested from forest areas or grown quickly elsewhere, and then converted simply without expensive machinery or facilities," he says. "In this way, it contributes substantially to poverty alleviation and wealth creation."

E Given bamboo's value in economic and ecological terms, the picture painted by the UNEP report is all the more worrying. But keen horticulturists will spot an apparent contradiction here. Those who've followed the recent vogue for cultivating exotic species in their gardens will point out that if it isn't kept in check, bamboo can cause real problems. "In a lot of places, the people who live with bamboo don't perceive it as being endangered in any way," says Kapos. "In fact, a lot of bamboo species are actually very invasive if they've been introduced." So why are so many species endangered? There are two separate issues here, says Ray Townsend, vice president of the British Bamboo Society and arboretum manager at the Royal Botanic Gardens. "Some plants are threatened because they can't survive in the habitat—they aren't strong enough or there aren't enough of them, perhaps. But bamboo can take care of itself—it is strong enough to survive if left alone. What is under threat is its habitat." It is the physical disturbance that is the threat to bamboo, says Kapos. "When forest goes, it is converted into something else: there isn't anywhere for forest plants such as bamboo to grow if you create a cattle pasture."

F Around the world, bamboo species are routinely protected as part of forest eco-systems in national parks and reserves, but there is next to nothing that protects bamboo in the wild for its own sake. However, some small steps are being taken to address this situation. The UNEP-INBAR report will help conservationists to establish effective measures aimed at protecting valuable wild bamboo species. Townsend, too, sees the UNEP report as an important step forward in promoting the cause of bamboo conservation. "Until now, bamboo has been perceived as a second-class plant. When you talk about places such as the Amazon, everyone always thinks about the hardwoods. Of course these are significant, but there is a tendency to overlook the plants they are associated with, which are often bamboo species. In many ways, it is the most important plant known to man. I can't think of another plant that is used so much and is so commercially important in so many countries." He believes that the most important first step is to get scientists into the field. "We need to go out there, look at these plants and see how they survive and then use that information to conserve them for the future."

Questions 1-7

Reading Passage 1 has six sections A-F.

Which section contains the following information?

Write the correct letter A-F in boxes 1-7 on your answer sheet

NB *You may use any letter more than once*

- 1 Comparison of bamboo with other plant species
- 2 Commercial products of bamboo
- 3 Limited extent of existing research
- 4 A human development that destroyed large areas of bamboo
- 5 How bamboos are put to a variety of uses
- 6 An explanation of how bamboo can help the survival of a range of plants
- 7 The methods used to study bamboo

Questions 8-11

Use the information in the passage to match the people (listed A-D) with opinions or deeds below.

Write the appropriate letters A-D in boxes 8-11 on your answer sheet.

NB you may use any letter more than once

- A Ian Redmond
- B Valerie Kapos
- C Ray Townsend
- D Chris Stapleton
- 8 Destroying bamboo jeopardizes to wildlife.
- 9 People have very confined knowledge of bamboo.
- 10 Some people do not think that bamboo is endangered.
- 11 Bamboo has loads of commercial potentials.

Questions 12-13

Answer the questions below using **NO MORE THAN TWO WORDS** from the passage for each answer.

Write your answers in boxes 12-13 on your answer sheet

What environmental problem does the unique root system of bamboo prevent? **12** _____

Which bamboo product is experiencing market expansion? **13** _____

READING PASSAGE 2

You should spend about 20 minutes on Question 14-26, which are based on Reading Passage 2 below.

New filter promises clean water for millions (Water Filter)

A An ingenious invention is set to bring clean water to the third world, and while the science may be cutting edge, the materials are extremely down to earth. A handful of clay yesterday's coffee grounds and some cow manure are the ingredients that could bring clean, safe drinking water to much of the third world.

B The simple new technology, developed by ANU materials scientist Mr. Tony Flynn, allows water filters to be made from commonly available materials and fired on the ground using cow manure as the source of heat, without the need for a kiln. The filters have been tested and shown to remove common pathogens (disease-producing organisms) including E-coli. Unlike other water filtering devices, the filters are simple and inexpensive to make. "They are very simple to explain and demonstrate and can be made by anyone, anywhere," says Mr. Flynn. "They don't require any western technology. All you need is terracotta clay, a compliant cow and a match."

C The production of the filters is extremely simple. Take a handful of dry, crushed clay, mix it with a handful of organic material, such as used tea leaves, coffee grounds or rice hulls, add enough water to make a stiff biscuit-like mixture and form a cylindrical pot that has one end closed, then dry it in the sun. According to Mr. Flynn, used coffee grounds have given the best results to date. Next, surround the pots with straw; put them in a mound of cow manure, light the straw and then top up the burning manure as required. In less than 60 minutes the filters are finished. The walls of the finished pot should be about as thick as an adult's index. The properties of cow manure are vital as the fuel can reach a temperature of 700 degrees in half an hour and will be up to 950 degrees after another 20 to 30 minutes. The manure makes a good fuel because it is very high in organic material that burns readily and quickly; the manure has to be dry and is best used exactly as found in the field, there is no need to break it up or process it any further.

D "A potter's din is an expensive item and can take up to four or five hours to get up to 800 degrees. It needs expensive or scarce fuel, such as gas or wood to heat it and experience to run it. With no technology, no insulation and nothing other than a pile of cow manure and a match, none of these restrictions apply," Mr. Flynn says.

E It is also helpful that, like terracotta clay and organic material, cow dung is freely available across the developing world. "A cow is a natural fuel factory. My understanding is that cow dung as a fuel would be pretty much the same wherever you would find it." Just as using manure as a fuel for domestic uses is not a new idea, the porosity of clay is something that potters have known about for years, and something that as a former ceramics lecturer in the ANU School of Art, Mr. Flynn is well aware of. The difference is that rather than viewing the porous nature of the material as a problem — after all not many people want a pot that won't hold water — his filters capitalize on this property.

F Other commercial ceramic filters do exist, but, even if available, with prices starting at US\$5 each, they are often outside the budgets of most people in the developing world. The filtration process is simple, but effective. The basic principle is that there are passages through the filter that are wide enough for water droplets to pass through, but too narrow for pathogens. Tests with the deadly E-coli bacterium have seen the filters remove 96.4 to 99.8 per cent of the pathogen — well within safe levels. Using only one filter it takes two hours to filter a litre of water. The use of organic material, which burns away after firing, helps produce the structure in which pathogens will become trapped. It overcomes the potential problems of finer clays that may not let water through and also means that cracks are soon halted. And like clay and cow dung, it is universally available.

G The invention was born out of a World Vision project involving the Manatuto community in East Timor. The charity wanted to help set up a small industry manufacturing water filters, but initial research found the local clay to be too fine — a problem solved by the addition of organic material. While the AF problems of producing a working ceramic filter in East Timor were overcome, the solution was kiln-based and particular to that community's materials and couldn't be applied elsewhere. Manure firing, with no requirement for a kiln, has made this zero technology approach available anywhere it is needed. With all the components being widely available, Mr. Flynn says there is no reason the technology couldn't be applied throughout the developing world, and with no plans to patent his idea, there will be no legal obstacles to it being adopted in any community that needs it. "Everyone has a right to clean water, these filters have the potential to enable anyone in the world to drink water safely," says Mr. Flynn.

Questions 14-19

Complete the flowchart, using **NO MORE THAN TWO WORDS** from the Reading Passage for each answer. Write your answers in boxes 1-6 on your answer sheet.

Guide to Making Water Filters

Step one: combination of **14** _____ and organic material, with sufficient **15** _____ to create a thick mixture sun dried.

Step two: pack **16** _____ around the cylinders place them in **17** _____ which is as burning fuel for firing (maximum temperature: **18** _____) filter being baked in under **19** _____

Questions 20-23

Do the following statements agree with the information given in Reading Passage?

In boxes 20-23 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

- 20 It takes half an hour for the manure to reach 950 degrees
- 21 Clay was initially found to be unsuitable for pot making
- 22 Coffee grounds are twice as effective as other materials
- 23 E-coli is the most difficult bacteria to combat

Questions 24-26

Choose the correct letter, A, B, C or D.

Write your answers in boxes 24-26 on your answer sheet.

- 24. When making the pot, the thickness of the wall
 - A is large enough to let the pathogens to pass.
 - B varied according to the temperature of the fuel,
 - C should be the same as an adult's forefinger.
 - D is not mentioned by Mr. Flynn.
- 25. What is true about the charity, it
 - A failed in searching the appropriate materials.
 - B successfully manufacture a kiln based ceramic filter to be sold worldwide
 - C found that the local clay are good enough.
 - D intended to help build a local filter production factory.
- 26. Mr. Flynn's design is purposely not being patented
 - A because he hopes it can be freely used around the world
 - B because he doesn't think the technology is perfect enough,
 - C because there are some legal obstacles.
 - D because the design has already been applied thoroughly.

READING PASSAGE 3

You should spend about 20 minutes on Question 27-40, which are based on Reading Passage 3 below.

Putting the brakes on climate change: Are hydrogen cars the answer?

A It is tempting to think that the conservation of coral reefs and rainforests is a separate issue from traffic and air pollution. But it is not. Scientists are now confident that rapid changes in the Earth's climate are already disrupting and altering many wildlife habitats. Pollution from vehicles is a big part of the problem.

B The United Nation's Climate Change Panel has estimated that the global average temperature rise expected by the year 2100 could be as much as 6°C, causing forest fires and dieback on land and coral bleaching in the ocean. Few species, if any, will be immune from the changes in temperature, rainfall and sea levels. The panel believes that if such catastrophic temperature rises are to be avoided, the quantity of greenhouse gases, especially carbon dioxide, being released into the atmosphere must be reduced. That will depend on slowing the rate of deforestation and, more crucially, finding alternatives to coal, oil and gas as our principal energy sources.

C Technologies do exist to reduce or eliminate carbon dioxide as a waste product of our energy consumption. Wind power and solar power are both spreading fast, but what are we doing about traffic? Electric cars are one possible option, but their range and the time it takes to charge their batteries pose serious limitations. However, the technology that shows the most potential to make cars climate-friendly is fuel-cell technology. This was actually invented in the late nineteenth century, but because the world's motor industry put its effort into developing the combustion engine, it was never refined for mass production. One of the first prototype fuel-cell-powered vehicles have been built by the Ford Motor Company. It is like a conventional car, only with better acceleration and a smoother ride. Ford engineers expect to be able to produce a virtually silent vehicle in the future.

D So what's the process involved – and is there a catch? Hydrogen goes into the fuel tank, producing electricity. The only emission from the exhaust pipe is water. The fuel-cell is, in some ways similar to a battery, but unlike a battery, it does not run down. As long as hydrogen and oxygen are supplied to the cell, it will keep on generating electricity. Some cells work off methane and a few use liquid fuels such as methanol, but fuel-cells using hydrogen probably have the most potential. Furthermore, they need not be limited to transport. Fuel-cells can be made in a huge range of size, small enough for portable computers or large enough for power stations. They have no moving parts and therefore need no oil. They just need a supply of hydrogen. The big question, then, is where to get it from.

E One source of hydrogen is water. But to exploit the abundant resource, electricity is needed, and if the electricity is produced by a coal-fired power station or other fossil fuel, then the overall carbon reduction benefit of the fuel-cell disappears. Renewable sources, such as wind and solar power, do not produce enough energy for it to be economically viable to use them in the 'manufacture' of hydrogen as a transport fuel. Another source of hydrogen is, however, available and could provide a supply pending the development of more efficient and cheaper renewable energy technologies. By splitting natural gas (methane) into its constituent parts, hydrogen and carbon dioxide are produced. One way round the problem of what to do with the carbon dioxide could be to store it back below ground – so-called geological sequestration. Oil companies, such as Norway's Statoil, are experimenting with storing carbon dioxide below ground in oil and gas wells.

F With freak weather conditions, arguably caused by global warming, frequently in the headlines, the urgent need to get fuel-cell vehicles will be available in most showrooms. Even now, fuel-cell buses are operating in the US, while in Germany a courier company is planning to take delivery of fuel-cell-powered vans in the near future. The fact that centrally-run fleets of buses and vans are the first fuel-cell vehicles

identifies another challenge – fuel distribution. The refueling facilities necessary to top up hydrogen-powered vehicles are available only in a very few places at present. Public transport and delivery firms are logical places to start since their vehicles are operated from central depots.

G Fuel-cell technology is being developed right across the automotive industry. This technology could have a major impact in slowing down climate change, but further investment is needed if the industry – and the world’s wildlife – is to have a long-term future.

Questions 27-32

Reading Passage has seven paragraphs, A-G.

Choose the correct heading for paragraphs A-F from the list of headings below.

Write the correct number, i-ix, in boxes 27-32 on your answer sheet.

List of Headings

- i Action already taken by the United Nations
- ii Marketing the hydrogen car
- iii Making the new technology available worldwide
- iv Some negative predictions from one group of experts
- v How the new vehicle technology works
- vi The history of fuel-cell technology
- vii A holistic view of climatic change
- viii Locating the essential ingredient
- ix Sustaining car manufacture

- 27 Paragraph A
- 28 Paragraph B
- 29 Paragraph C
- 30 Paragraph D
- 31 Paragraph E
- 32 Paragraph F

Questions 33-36

Complete the sentences below.

*Choose **NO MORE THAN TWO WORDS** from the passage for each answer.*

Write your answers in boxes 33-36 on your answer sheet.

- 33 In the late nineteenth century, the car industry invested in the development of the **33** _____, rather than fuel-cell technology.
- 34 Ford engineers predict that they will eventually design an almost **34** _____ car.
- 35 While a fuel-cell lasts longer, some aspects of it are comparable to a **35** _____.
- 36 Fuel-cells can come in many sizes and can be used in power stations and in **36** _____ as well as in vehicles.

Questions 37-40

Do the following statements agree, with the information given in Reading Passage?

In boxes 37-40 on your answer sheet, write

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this

37 Using electricity produced by burning fossil fuels to access sources of hydrogen may increase the positive effect of the fuel-cell.

38 The oil company Statoil in Norway owns gas wells in other parts of the world.

39 Public transport is leading the way in the application of fuel-cell technology.

40 More funding is necessary to ensure the success of the fuel-cell vehicle industry.