READING PASSAGE 1

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

Save the Turtles

A

Leatherback turtles follow the general sea turtle body plan of having a large, flattened, round body with two pairs of very large flippers and a short tail. Like other sea turtles, the leatherback's flattened forelimbs are specially adapted for swimming in the open ocean. Claws are noticeably absent from both pair of flippers. The leatherback's flippers are the largest in proportion to its body among the extant sea turtles. Leatherback front flippers can grow up to 2.7 meters in large specimens, the largest flippers (even in comparison to its body) of any sea turtle. As the last surviving member of its family, the leatherback turtle has several distinguishing characteristics that differentiate it from other sea turtles. Its most notable feature is that it lacks the bony carapace of the other extant sea turtles.

B

During the past month, four turtles have washed up along Irish coasts from Wexford to Kerry. These turtles are more typical of warmer waters when they stray off course. It is likely that they may have originated from Florida, America. Two specimens have been taken to Coastal and Marine Resources Centre, University College Cork, where a necropsy will be conducted to establish their age, sex and their exact origin. During this same period, two Leatherback turtles were found in Scotland, and a rare Kemp's Ridley turtle was found in Wales, thus making it an exceptional month for stranded turtles in Ireland and the UK.

C

Actually, there has been extensive research conducted regarding the sea turtles' abilities to return to their nesting regions and sometimes exact locations from hundreds of miles away. In the water, their path is greatly affected by powerful currents. Despite their limited vision, and lack of landmarks in the open water, turtles are able to retrace their migratory paths. Some explanations of this phenomenon have found that sea turtles can detect the angle and intensity of the earth's magnetic fields.

D

However, leatherback turtles are not normally found in Irish waters, because water temperatures here are far too cold for their survival. Instead, adult Leatherback prefer the warmers waters of the Mediterranean, the Caribbean and North America's east coast. The four turtles that were found have probably originated from the North America. However it will require genetic analysis to confirm this assumption. It is thought that after leaving their nesting beach as hatchlings, these

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tiny turtles enter the North Atlantic Gyre that takes them from America, across to Europe, down towards North Africa, before being transported back again to America via a different current. This remarkable round trip may take many years during which these tiny turtles grow by several centimeters a year. Leatherback may circulate around the North Atlantic several times before they settle in the coastal waters of Florida or the Caribbean.

E

These four turtles probably on their way around the Atlantic when they strayed a bit too far north from the Gulf Stream. Once they did, their fate was sealed, as the cooler waters of the North East Atlantic are too cold for Leatherback, unlike some other turtles which have many anatomical and physiological adaptations to enable them to swim in different seas. Once in cool waters, the body of a Leatherback begins to shut down as they get 'cold stunned', then get hypothermia and die.

F

Leatherbacks are in imminent danger of extinction. A critical factor is the harvesting of eggs from nests. Values as a food delicacy, Leatherback eggs are falsely touted to have aphrodisiacal properties in some cultures. The Leatherback, unlike the Green Sea turtles, is not often killed for its meat; however, the increase in human populations coupled with the growing back market trade has escalated their egg depletion. Other critical factors causing the leatherbacks' decline are pollution such as plastics –leatherbacks eat this debris thinking it is jellyfish; fishing practices such as longline fishing and gill nets, and development on habitat areas. Scientists have estimated that there only about 35,000 Leatherback turtles in the world.

G

We are often unable to understand the critical impact a species has on the environment –that is, until that species becomes extinct. Even if we do not know the role a creature plays in the health of the environment, past lessons have taught us enough to know that every animal and plant is one important link in the integral chain of nature. Some scientists now speculate that the Leatherback may play an important role in the recovery of diminishing fish populations. Since the Leatherback consumes its weight in jellyfish per day, it helps to keep jellyfish populations in check. Jellyfish consume large quantities of fish larvae. The rapid decline in Leatherback populations over the last 50 years has been accompanied by a significant increase in jellyfish and a marked decrease in fish in our oceans. Saving sea turtles is an International endeavor.

Questions 1-6

Choose the most suitable heading for paragraphs **B-G** from the list of heading below.

*Write appropriate number (**i-x**) in boxes **1-6** on your answer sheet.*

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

List of Headings

i Sea turtles are found in unusual locations
ii Unique features of the Leatherbacks
iii The Leatherback's contribution
iv Methods used for routes tracking
v Predict the migration routes
vi Remains multiplicity within the species
vii The progress of hatching
viii The fate of the lost turtles
ix How trips suppose to look like?
x Factors leading to population decline

1 Paragraph **B**
2 Paragraph **C**
3 Paragraph **D**
4 Paragraph **E**
5 Paragraph **F**
6 Paragraph **G**

Questions 7-13

Choose words from the passage to answer the questions **7-13**.
Write **NO MORE THAN THREE WORDS** for each answer.

7 How many Leatherback turtles are there in the world?
8 What is the most noticeable difference between other sea turtles and leatherbacks?
9 What caused leatherback turtles to die in Irish waters?
10 Where did the four turtles probably come from?
11 By which means can sea turtles retrace their migratory paths?
12 For what purpose are Green Sea turtles killed by people?
13 What kind of species will benefit from a decline in Leatherback population?

READING PASSAGE 2

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

Desertification

A

The world's great deserts were formed by natural processes interacting over long intervals of time. During most of these times, deserts have grown and shrunk independent of human activities. Paleodeserts, large sand seas now inactive because they are stabilized by vegetation, extend well beyond the present margins

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of core deserts, such as the Sahara. In some regions, deserts are separated sharply from surrounding, less arid areas by mountains and other contrasting landforms that reflect basic structural differences in the regional geology. In other areas, desert fringes form a gradual transition from a dry to a more humid environment, making it more difficult to define the desert border.

B

These transition zones have very fragile, delicately balanced ecosystems. Desert fringes often are a mosaic of microclimates. Small hollows support vegetation that picks up heat from the hot winds and protects the land from the prevailing winds. After rainfall the vegetated areas are distinctly cooler than the surroundings. In these marginal areas, human activity may stress the ecosystem beyond its tolerance limit, resulting in degradation of the land. By ponding the soil with their hooves, livestock compact the substrate, increase the proportion of fine material, and reduce the percolation rate of the soil, thus encouraging erosion by wind and water. Grazing and the collection of firewood reduces or eliminates plants that help to bind the soil.

C

This degradation of formerly productive land – desertification – is a complex process. It involves multiple causes, and it proceeds at varying rates in different climates. Desertification may intensify a general climatic trend toward greater aridity, or it may initiate a change in local climate.

D

Desertification does not occur in linear, easily mappable patterns. Deserts advance erratically, forming patches on their borders. Areas far from natural deserts can degrade quickly to barren soil, rock, or sand through poor land management. The presence of a nearly desert has no direct relationship to desertification. Unfortunately, an area undergoing desertification is brought to public attention only after the process is well underway. Often little or no data are available to indicate the previous state of the ecosystem or the rate of degradation. Scientists still question whether desertification, as a process of global change, is permanent or how and when it can be halted or reversed.

E

Desertification became well known in the 1930's when part of the Great Plains in the United States turned into the "Dust Bowl" as a result of drought and poor practices in farming, although the term itself was not used until almost 1950. During the dust bowl period, millions of people were forced to abandon their farms and livelihoods. Greatly improves methods of agriculture and land and water management in the Great Plains have prevented that disaster from recurring, but desertification presently affects millions of people in almost every continent. Increased population and livestock pressure on marginal lands has accelerated

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desertification. In some areas, nomads moving to less arid areas disrupt the local ecosystem and increase the rate of erosion of the land. Nomads are trying to escape the desert, but because of their land-use practices, they are bringing the desert with them.

F

It is a misconception that drought cause desertification. Droughts are common in arid and semiarid lands. Well-managed lands can recover from drought when the rains return. Continued land abuse during droughts, however, increases land degradation. By 1973, the drought that began in 1968 in the Sahel of West Africa and the land-use practices there had caused the deaths of more than 100,000 people and 12 million cattle, as well as the disruption of social organizations from villages to the national level.

G

At the local level, individuals and governments can help to reclaim and protect their lands. In areas of sand dunes, covering the dunes with large boulders or petroleum will interrupt the wind regime near the face of the dunes and prevent the sand from moving. Sand fences are used throughout the Middle East and the United States, in the same way snow fences are used in the north. Placement of straw grids, each up to a square meter in area, will also decrease the surface wind velocity. Shrubs and trees planted within the grids are protected by the straw until they take root. In areas where some water is available for irrigation, shrubs planted on the lower one third of a dune's windward side will stabilize the dune. This vegetation decreases the wind velocity near the base of the dune and prevents much of the sand from moving.

H

Oases and farmlands in windy regions can be protected by planting tree fences or grass belts. Sand that manages to pass through the grass belts can be caught in strips of trees planted as wind breaks 50 to 100 meters apart adjacent to the belts. Small plots of trees may also be scattered inside oases to stabilize the area. On a much larger scale, a "Green Wall", which will eventually stretch more than 5,700 kilometers in length, much longer than the famous Great Wall, is being planted in northeastern China to protect "sandy lands" –deserts believed to have been created by human activity.

I

More efficient use of existing water resources and control of salinization are other effective tools for improving arid lands. New ways are being sought to use surface-water resources such as rain water harvesting or irrigating with seasonal runoff from adjacent highlands. Research on the reclamation of deserts also is focusing on discovering proper crop rotation to protect the fragile soil, on understanding how

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sand-fixing plants can be adapted to local environments, and on how grazing lands and water resources can be developed effectively without being overused.

Questions 14-19

Reading Passage 2 contains 9 paragraphs **A-I**.
Which paragraphs state the following information?
*Write the appropriate letters **A-I** in boxes **14-19** on your answer sheet.*

14 Desertification poses a threat to people worldwide.
15 It is difficult to describe the process of desertification.
16 Desertification may alter local climates.
17 People have misconceptions regarding desertification origins.
18 It is hard to notice desertification in its early stages.
19 Straw grids diminish the swiftness of the surface wind.

Questions 20-23

Do the following statements agree with the claims of the writer in Reading Passage 2?
*In boxes **20-23** write*

YES if the statement agree with the views of the writer
NO if the statement contradicts with the views of the writer
NOT GIVEN if it is impossible to say what the writer thinks about this.

20 All desert borders are difficult to define.
21 Desertification is a reversible process.
22 Part of the Great Plains did not become a so-called "Dust Bowl" until almost 1950.
23 Nomads cannot get away from the desert because of their current land-use methods.

Questions 24-26

Complete the summary below.
Use **NO MORE THAN THREE WORDS** from the passage for each answer.
Tree fences or grass belts planted inside oases can catch sand in the wind and **24** _____ these areas as well. The "Green Wall" is an example. Water resource management and prevention of **25** _____ are also effective in protecting lands. Scientists are trying to find **26** _____ to protect the vulnerable soil.

READING PASSAGE 3

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

The Ingenuity Gap

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Ingenuity, as I define it here, consists not only of ideas for new technologies like computers or drought-resistant crops but, more fundamentally, of ideas for better institutions and social arrangements, like efficient markets and competent governments.

How much and what kinds of ingenuity a society requires depends on a range of factors, including the society's goals and the circumstances within which it must achieve those goals—whether it has a young population or an ageing one, an abundance of natural resources or a scarcity of them, an easy climate or a punishing one, whatever the case may be.

How much and what kinds of ingenuity a society supplies also depends on many factors, such as the nature of human inventiveness and understanding, the rewards an economy gives to the producers of useful knowledge, and the strength of political opposition to social and institutional reforms.

A good supply of the right kind of ingenuity is essential, but it isn't, of course, enough by itself. We know that the creation of wealth, for example, depends not only on an adequate supply of useful ideas but also on the availability of other, more conventional factors of production, like capital and labor. Similarly, prosperity, stability and justice usually depend on the resolution, or at least the containment, of major political struggles over wealth and power. Yet within our economies ingenuity often supplants labor, and growth in the stock of physical plant is usually accompanied by growth in the stock of ingenuity. And in our political systems, we need great ingenuity to set up institutions that successfully manage struggles over wealth and power. Clearly, our economic and political processes are intimately entangled with the production and use of ingenuity.

The past century's countless incremental changes in our societies around the planet, in our technologies and our interactions with our surrounding natural environments, have accumulated to create a qualitatively new world. Because these changes have accumulated slowly, it's often hard for us to recognize how profound and sweeping they've been. They include far larger and denser populations; much higher per capita consumption of natural resources; and far better and more widely available technologies for the movement of people, materials, and especially information.

In combination, these changes have sharply increased the density, intensity, and pace of our interactions with each other; they have greatly increased the burden we place on our natural environment; and they have helped shift power from national and international institutions to individuals in subgroups, such as political special interests and ethnic factions.

As a result, people in all walks of life—from our political and business leaders to all of us in our day-to-day—must cope with much more complex, urgent, and often

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unpredictable circumstances. The management of our relationship with this new world requires immense and ever-increasing amounts of social and technical ingenuity. As we strive to maintain or increase our prosperity and improve the quality of our lives, we must make far more sophisticated decisions, and in less time, than ever before.

When we enhance the performance of any system, from our cars to the planet's network of financial institutions, we tend to make it more complex. Many of the natural systems critical to our well-being, like the global climate and the oceans, are extraordinarily complex, to begin with. We often can't predict or manage the behavior of complex systems with much precision, because they are often very sensitive to the smallest of changes and perturbations, and their behavior can flip from one mode to another suddenly and dramatically. In general, as the human-made and natural systems, we depend upon becoming more complex, and as our demands on them increase, the institutions and technologies we use to manage them must become more complex too, which further boosts our need for ingenuity.

The good news, though, is that the last century's stunning changes in our societies and technologies have not just increased our need for ingenuity; they have also produced a huge increase in its supply. The growth and urbanization of human populations have combined with astonishing new communication and transportation technologies to expand interactions among people and produce larger, more integrated, and more efficient markets. These changes have, in turn, vastly accelerated the generation and delivery of useful ideas.

But—and this is the critical "but"—we should not jump to the conclusion that the supply of ingenuity always increases in lockstep with our ingenuity requirement: while it's true that necessity is often the mother of invention, we can't always rely on the right kind of ingenuity appearing when and where we need it. In many cases, the complexity and speed of operation of today's vital economic, social, and ecological systems exceed the human brain's grasp. Very few of us have more than a rudimentary understanding of how these systems work. They remain fraught with countless "unknown unknowns," which makes it hard to supply the ingenuity we need to solve problems associated with these systems.

In this book, I explore a wide range of other factors that will limit our ability to supply the ingenuity required in the coming century. For example, many people believe that new communication technologies strengthen democracy and will make it easier to find solutions to our societies' collective problems, but the story is less clear than it seems. The crush of information in our everyday lives is shortening our attention span, limiting the time we have to reflect on critical matters of public policy, and making policy arguments more superficial.

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Modern markets and science are an important part of the story of how we supply ingenuity. Markets are critically important because they give entrepreneurs an incentive to produce knowledge. As for science, although it seems to face no theoretical limits, at least in the foreseeable future, practical constraints often slow its progress. The cost of scientific research tends to increase as it delves deeper into nature. And science's rate of advance depends on the characteristic of the natural phenomena it investigates, simply because some phenomena are intrinsically harder to understand than others, so the production of useful new knowledge in these areas can be very slow. Consequently, there is often a critical time lag between the recognition between a problem and the delivery of sufficient ingenuity, in the form of technologies, to solve that problem. Progress in the social sciences is especially slow, for reasons we don't yet understand; but we desperately need better social scientific knowledge to build the sophisticated institutions today's world demands.

Questions 27-30

Complete each sentence with the appropriate answer, **A**, **B**, **C**, or **D**.

*Write the correct answer in boxes **27-30** on your answer sheet*

27 The definition of ingenuity

28 The requirement for ingenuity

29 The creation of social wealth

30 The stability of society

A depends on many factors including climate.

B depends on the management and solution of disputes.

C is not only of technological advance but more of institutional renovation.

D also depends on the availability of some traditional resources.

Questions 31-33

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

*Write your answers in boxes **31-33** on your answer sheet.*

31 What does the author say about the incremental change of the last 100 years?

A It has become a hot scholastic discussion among environmentalists.

B Its significance is often not noticed.

C It has reshaped the natural environments we live in.

D It benefited a much larger population than ever.

32 The combination of changes has made life:

A easier

B faster

C slower

D less sophisticated

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33 What does the author say about the natural systems?

A New technologies are being developed to predict change with precision.

B Natural systems are often more sophisticated than other systems.

C Minor alterations may cause natural systems to change dramatically.

D Technological developments have rendered human being more independent of natural systems.

Questions 34-40

Do the following statements agree with the information given in the Reading Passage 3?

*In boxes **34-40** 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

34 The demand for ingenuity has been growing during the past 100 years.

35 The ingenuity we have may be inappropriate for solving problems at hand.

36 There are very few who can understand the complex systems of the present world.

37 More information will help us to make better decisions.

38 The next generation will blame the current government for their conduct.

39 Science tends to develop faster in certain areas than others.

40 Social science develops especially slowly because it is not as important as natural science.

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