

ALL answers must be indicated on the MARK SHEET.

I Read the following passage and answer the questions below.

① It is a challenge to go anywhere without stepping on a piece of Lego-related hype¹. *The Lego Movie* spent three weeks at the number one position at the American box office not long ago. Model kits related to the film piled high in the shops, adding to the already gigantic heap of Lego pieces in circulation: 86 for every person on the planet. The toymaker has enjoyed ten years of spectacular growth, almost quadrupling its revenue. In 2012 it overtook Hasbro to become the world's second-largest toymaker, while the number one, Mattel, is fishing for new acquisitions to help it fend off the challenge from Lego.

② This is remarkable for many reasons. Lego's hometown, Billund in rural Denmark, is so small that the company had to provide it with a hotel—an elegant one, not surprisingly. The toy business is one of the world's trickiest: perennially² faddish and, these days, driven by technological innovation. Children are growing up ever faster, and increasingly abandoning the physical world for the virtual one. To cap it all, the company almost collapsed in 2003 and 2004, having drifted for years, diversifying into too many areas and producing too many products. In a fit of desperation, it even flirted with the idea of becoming a “lifestyle” company, with Lego-branded clothes and watches.

③ Lego's decade of success began when it appointed Jørgen Vig Knudstorp as chief executive. This was a risky move. Mr. Knudstorp was a mere 35 years old when he took up the role, and had cut his teeth³ as a management consultant rather than by running a toy company—or heading up any business. But it proved to be an inspired decision. Mr. Knudstorp decreed that the company must go “back to the brick,” focusing on its core products, forgetting about brand-stretching, and even selling its theme parks. He also brought in stricter management controls, for example reducing the number of different pieces that the company produced by almost half, from 12,900 to 7,000.

④ Under Mr. Knudstorp, Lego has struck a successful balance between innovation and tradition. The company has had to generate new ideas to keep its sales growing: customers need a reason to expand their stock of bricks, and to buy them from Lego rather than cheaper rivals. At the same time, it must resist the sort of undisciplined innovation that almost ruined it. Lego produces a stream of kits with ready-made designs, such as forts and spaceships, to provide children with templates. But it also insists that the pieces can be added to a child's collection of bricks and reused to make all sorts of different things.

⑤ Lego has gotten better at managing its relationships. *The Lego Movie* demonstrates how it can focus on the brick while venturing into the virtual world: Warner Bros. made the film, while Lego provided the models. During its years of drift⁴, the company relied too much on other firms' blockbuster franchises, such as Harry Potter and Star Wars. This time Lego's intellectual property, not someone else's, is the star of the film. It has also become better at tapping its legion⁵ of fans—particularly adult fans of Lego, or AFOLs—for new ideas.

⑥ Can the company continue its winning streak? Its growth is slowing, and Mr. Knudstorp has suggested that harder times are ahead: “When the company is getting bigger and the market isn't growing, it's a pure mathematical consequence that growth rates will have to reach a more sustainable level,” he has noted. Lego is now building its organizational capacity and embracing globalization, in a bid to find new sources of growth. The company has invested heavily in new production facilities and in recruiting and training new workers. It is expanding two existing factories—in Kladno in the Czech Republic⁶ and Monterrey in Mexico—and building two new ones—in Nyíregyháza in Hungary and, most important of all, in Jiaxing in China. Its management is being globalized too, with regional offices being opened in Singapore and Shanghai (as well as in London). The aim is twofold: to replicate⁷ in the rapidly growing east Lego's success in the west, and to transform a local company that happened to go global into a global company that happens to have its head office in Billund.

⑦ Globalization is fraught⁸ with difficulties. Lego is relatively late in making its China play—jumping in when some other western firms are jumping out with nothing but regrets to show for it. Lego also owes

its identity to its roots in small-town Denmark: Ole Kirk Kristiansen, its founder, made up the company name from the first two letters of two Danish words, *leg godt*, or play well, and committed his company to “nurture the child in each of us.” An earlier attempt to move some of the responsibilities for designing products to an office in Milan proved to be a disaster. But the case for embracing globalization is nevertheless compelling. The Chinese middle class is exploding, the toy business in the west is stagnant, and Lego needs a ⁹global workforce if it is to serve a global market.

⑧ Lego also has one important force on its side in its battle to globalize: parents in emerging markets, just like those in the rich world, are convinced that the company’s products are good for their children. Grown-ups everywhere welcome it as a ¹⁰respite from the endless diet of videos and digital games that their offspring would otherwise consume. Chinese adults, including those very grown-up ones in government ministries, hope it will provide the secret ingredient that their education system sorely lacks — creativity. *The Lego Movie* may have provided the company with a welcome boost during the toy industry’s post-Christmas doldrums, but Lego’s long-term success rests on adults feeling reassured at buying a toy whose roots lie in an age before video games, mobile apps, and toy-themed films.

[Adapted from “Unpacking Lego,” *The Economist*, March 8, 2014]

(1) Choose the best way to complete these sentences about paragraphs ① to ⑧.

1 In paragraph ① the writer	2 In paragraph ② the writer
3 In paragraph ③ the writer	4 In paragraph ④ the writer
5 In paragraph ⑤ the writer	6 In paragraph ⑥ the writer
7 In paragraph ⑦ the writer	8 In paragraph ⑧ the writer

- A discusses how Lego bricks are manufactured, including the chemical processes involved in making plastic.
- B discusses the appointment of Jørgen Vig Knudstorp as chief executive, and outlines some of his main early changes to the company’s strategy.
- C explains how Lego can and does leverage parents, not least of all in the developing world, to expand its market share.
- D focuses on how, under Mr. Knudstorp, Lego has struck a good balance between maintaining some old practices and creating some new ones.
- E lays out how popular Lego is at the time of writing.
- F mentions how Lego has become far better at drawing on its fans for new ideas.
- G states Lego’s plans to move their corporate headquarters to a major Chinese city.
- H talks about the potential and the challenges that globalization is creating, and will continue to create, for Lego.
- I talks about Lego’s origins and the troubles it experienced up to 2004.
- J talks about Lego’s strategy to renew its growth and build new markets, including by expanding current factories and opening new ones in growing markets.

(2) Choose the best way to complete each of these sentences, which refer to the underlined words in the passage.

- | | | | |
|------------------------------------|--------------------|--------------------|----------------------|
| 1 Here, <u>hype</u> means | A anger. | B damage. | C excitement. |
| | D lies. | E quiet. | |
| 2 Here, <u>perennially</u> means | A always. | B eventually. | C needlessly. |
| | D possibly. | E unhappily. | |
| 3 Here, <u>cut his teeth</u> means | A collaborated. | B conspired. | C gained experience. |
| | D injured himself. | E suffered a loss. | |
| 4 Here, <u>drift</u> means | A aimlessness. | B consolidation. | C contraction. |
| | D expansion. | E success. | |
| 5 Here, <u>legion</u> means | A 1,000. | B 1,000,000. | C countless. |
| | D handful. | E oldest. | |
| 6 Here, <u>recruiting</u> means | A asking. | B employing. | C guiding. |
| | D proposing. | E studying. | |
| 7 Here, <u>replicate</u> means | A rally. | B reduce. | C remove. |
| | D reproduce. | E restore. | |
| 8 Here, <u>fraught</u> means | A cautious. | B equipped. | C filled. |
| | D frightened. | E unequipped. | |
| 9 Here, <u>compelling</u> means | A bad quality. | B convincing. | C debatable. |
| | D forcing. | E unclear. | |
| 10 Here, <u>respite</u> means | A break. | B despite. | C outcome. |
| | D reasoning. | E result. | |

(3) Choose the FOUR statements that do NOT agree with what the passage says.

- A Although Mr. Knudstorp came from a consulting background rather than having worked in a toy company, he has been a very successful chief executive.
- B It was almost certainly an ill-conceived idea for Lego to become a “lifestyle” company, as it nearly did prior to Mr. Knudstorp taking over as chief executive.
- C Lego has had roughly a decade of strong performance, but its growth rate subsequently appears to be slowing.
- D Lego is not just a toy for kids: there are many so-called AFOLs, or adult fans of Lego.
- E Lego is so popular that there are now 86 Lego kits for every person alive today.
- F Lego’s strategy for expansion in Asia seems well reasoned.
- G Mr. Knudstorp has proven to be a popular chief executive of Lego, but he has been too short-sighted in the strategy he has set for the company.
- H Ole Kirk Kristiansen, the founder of Lego, handed management of the company to Mr. Knudstorp in 2004.
- I The company is not only expanding two of its factories, but also building two new ones.
- J *The Lego Movie* proved particularly popular in the United States, especially compared to Europe.

II Read the following passage and answer the questions below.

① What is a universal language? I consider it to be the language that most clearly defines the difference between written language and spoken language. A spoken word disappears into thin air the moment it is uttered. In contrast, a written word remains and can be copied. Not only can it be copied, but it also can be spread. The Rosetta Stone, onto which three ancient writings are carved, weighs approximately 760 kilograms (1,675 pounds) and cannot be moved by the mightiest of men. If successive generations always had to travel across oceans and mountains to Egypt to read what was carved on it, the Rosetta Stone would have made hardly any impact on humanity. The advent¹ of parchment (the skin of a sheep or goat that was used for writing) and paper made the written word something that could be copied again and again and spread afar, reaching speakers of different languages in distant lands, some of whom would learn to read and then to write that “external language”—the universal language. It is thanks to these characteristics specific to written words that humans have had the means to accumulate² a wealth of knowledge over the centuries.

② *Homo sapiens* means “wise men.” And we humans are wise not only because we are more intelligent than other animals, but also because we seek knowledge and can hand down the knowledge we attain to following generations, through words. The invention of written language did not make us any more intelligent, but it allowed us to accumulate knowledge exponentially—which brings us to this conclusion: if all people in the world read and wrote a single written language, regardless of their spoken language, our pool of knowledge would expand most efficiently. I’m not here referring to all sorts of knowledge, but to knowledge with more or less universal applicability. In fact, the more universally applicable knowledge is, the more efficient it would be to expand it in a single written language. Our pursuit of knowledge in mathematics, the purest of the sciences, is conducted in a single common written language, the language of mathematics. This written language is comprehensible everywhere in the world, no matter what language a person speaks. Mathematical language, which isn’t anyone’s mother tongue, is the purest form of universal language.

③ No one knows for certain the origin of written language. It may have been invented to record trade, or it may have its roots in magical rituals³. Yet one thing is clear: the birth of a writing system is extremely rare. Most of the writing systems that exist today are derived from some script that became a template⁴ for future variations. For the overwhelming majority of human societies, written language was not something that they invented on their own but rather something that came to them from their neighbors.

④ All cultures begin as an oral culture, and at some point, some of them have a transformative first encounter with a writing system. Yet the transformation⁵ from oral culture to written does not take place just because a writing system arrives one day from next door. People do not immediately say, “Well, here we have this wonderful thing, now let’s try using it to write our own language,” and suddenly create a written culture. Possession of a spade and a hoe does not turn people into farmers overnight; becoming a farmer requires an understanding of the meaning of farming. The principle is even truer when it comes to something as complicated as writing. Besides, what initially arrives from a neighboring community is not writing as an abstract entity⁶ but concrete items such as scrolls with writing on them. And the transformation of a culture from oral to written requires that a small number of people learn to read those scrolls, written in the “external language.” It requires the emergence of a group of bilinguals.

⑤ Those scrolls may come in different ways: from enemies in war, from partners in trade, or from refugees arriving in waves. They may be brought as gifts from an emperor, carried preciously above the messenger’s head; or by monks as part of their missionary enterprise; or yet again as words hidden deep in the pockets of exiles. Yet scrolls, even if they are placed in a golden box, differ from other treasures in a critical⁷ way. They surely need to exist as physical objects, but without the act of reading, they are nothing more than sheets of parchment or paper decorated with dots and squiggles. The essence of the written word lies not in the written word itself but in the act of *reading*.

⑥ Something critical happens when the group of bilinguals learns to read imported scrolls: they gain entry into a *library*. I use the word “library” to refer not to a physical building but, more broadly, to the

collectivity of accumulated writing. Despite the historical impacts of wars, fires, floods, and even book burnings, humans possess an ever-increasing store of writings, the totality of which is what I call the library. The transformation of an oral culture into a written one means, first and foremost, the potential entry of bilinguals into a library.

⑦ The importance of access to a library cannot be overemphasized. For if, after being introduced to writing, *Homo sapiens* became “wise men” on a totally different level, this change certainly did not come about because people were able to memorize all they read. The memory of an elderly sage in an oral culture would surely ⁸trump that of any bilingual in a written culture. No, what transformed *Homo sapiens* into those with knowledge on a higher level was people’s newfound ability to enter, through the act of reading, the library of accumulated human knowledge. And doing so usually meant reading a universal language, necessitating that the reader be bilingual.

⑧ Some may object to this statement, pointing out, for instance, that the ancient Romans read and wrote the same Latin that they spoke. Such an objection is founded on the familiar, false ⁹premise that written language is a mere representation of spoken language. It ignores the fact that before those Romans began to read and write in Latin, they read and wrote in Koine Greek—a language that combined different dialects with Attic Greek, the Athenian dialect—which was then the universal language of the area around the eastern Mediterranean Sea. If Cato the Elder (234–149 BCE) had not begun writing Latin prose, the Romans might well have continued to write in Greek. Educated Romans naturally remained bilingual even in the golden age of Latin literature. Any description of the prose of Cicero (106–43 BCE) or Seneca (ca. 4 BCE–65 CE) as “literary” is also founded on the premise that written language is a direct representation of spoken language—a premise that until modern times no one entertained even with their own language.

⑨ Needless to say, there was not just one library but various libraries in different regions, according to the reigning universal language. And all these various libraries initially centered on the most important ¹⁰written words of each region, the sacred texts—records of words uttered or written by those believed to have attained the kind of knowledge impossible for ordinary human beings to attain: Buddha, Confucius, Socrates, Christ, and Mohammad among them. For those who sought higher knowledge, the sacred texts were the “text to read.”

[Adapted from Minae Mizumura, *The Fall of Language in the Age of English* (English translation 2015)]

(1) Choose the best way to complete each of these sentences about paragraphs ① to ⑨.

1 Paragraph ①	2 Paragraph ②	3 Paragraph ③
4 Paragraph ④	5 Paragraph ⑤	6 Paragraph ⑥
7 Paragraph ⑦	8 Paragraph ⑧	9 Paragraph ⑨

- A claims that the sacred texts of the sages, kept in various libraries in different regions, were the most important texts for seekers of knowledge.
- B claims that the use of a universal language, such as mathematics, would contribute to the development of human knowledge.
- C contests the idea that written language is a mere representation of spoken language.
- D describes how *Homo sapiens* became “wise men” when access to collective human knowledge meant that relying only on memorization was no longer essential.
- E explains that a universal language became widespread in trade because it was convenient.
- F introduces the notion of the library as an archive of human knowledge into which bilinguals can freely enter.
- G points out that imported scrolls are essentially worthless if nobody can read them.
- H states that the majority of societies first encountered written language as something introduced from neighboring cultures.
- I suggests that the emergence of people who can read imported texts is an important factor for a shift from an oral culture to a written one.
- J uses the essential difference between spoken and written languages in order to define the term “universal language.”

(2) Choose the FOUR statements below which AGREE with what is written in the passage.
You must NOT choose more than FOUR statements.

- A Ancient Romans used Koine Greek, the universal language of the region, before they started reading and writing in Latin.
- B Cato the Elder was an important figure in ancient Greece.
- C Generations of scholars travelled to Egypt in order to read the ancient languages carved on the Rosetta Stone.
- D Historically, universal languages typically formed when a civilization exerted influence by spreading the written word to neighboring cultures.
- E Human cultures were able to accumulate knowledge once they developed or adopted writing systems.
- F In almost all oral cultures, people tried to establish their own writing systems.
- G Physical library buildings were essential to the accumulation of knowledge and wisdom.
- H The language of mathematics is a good example of the purest form of a universal language.
- I The literary prose of Cicero or Seneca is a direct representation of their spoken language.

(3) Choose the best way to complete each of these sentences, which refer to the underlined words in the passage.

1 Here, advent means

- | | | |
|------------------|----------------|------------|
| A advertisement. | B advice. | C arrival. |
| D betterment. | E improvement. | |

2 Here, accumulate means

- | | | |
|--------------|------------|---------------|
| A circulate. | B deliver. | C distribute. |
| D gather. | E scatter. | |

3 Here, rituals means

- | | | |
|---------------|-----------|----------|
| A ceremonies. | B favors. | C forms. |
| D policies. | E styles. | |

4 Here, template means

- | | | |
|-------------|----------------|---------|
| A category. | B function. | C look. |
| D model. | E temperament. | |

5 Here, transformation means

- | | | |
|---------------|------------------|-----------------|
| A change. | B discarding. | C preservation. |
| D protection. | E understanding. | |

6 Here, entity means

- | | | |
|---------------|-----------|------------|
| A character. | B factor. | C quality. |
| D supplement. | E thing. | |

7 Here, critical means

- | | | |
|-----------------|------------------|------------|
| A analytical. | B complimentary. | C crucial. |
| D disapproving. | E fault-finding. | |

8 Here, trump means

- | | | |
|------------|------------|-------------|
| A equal. | B fail. | C go below. |
| D neglect. | E surpass. | |

9 Here, premise means

- | | | |
|----------|--------------|--------|
| A claim. | B disbelief. | C law. |
| D proof. | E reality. | |

10 Here, reigning means

- | | | |
|--------------|----------------|-------------|
| A dependent. | B dominant. | C inferior. |
| D lesser. | E subordinate. | |

III Read the following passage and answer the questions below.

Let's begin with a simple fact: time passes faster in the mountains than it does at sea level. The difference is small but can be measured with precision timepieces that can be bought today on the internet for a few thousand dollars. With practice, anyone can [1] the slowing down of time. With the timepieces of specialized laboratories, this slowing down of time can be detected between levels just a few centimeters apart: a clock placed on the floor runs a little more slowly than one on a table. It is not just the clocks that slow down: lower down, all processes are slower. Two friends separate, with one of them living in the plains and the other going to live in the mountains. They meet up again years later: the one who has stayed down has lived less, aged less, the mechanism of his cuckoo clock has swung [2] times. He has had less time to do things, his plants have grown less, his thoughts have had less time to unfold. Lower down, there is simply less time than at altitude.

I have an enduring passion for Anaximander, the Greek philosopher who lived twenty-six [3] ago and understood that the Earth floats in space, seemingly supported by nothing. We know of Anaximander's thought from other writers. Only one small original fragment of his writings has survived—just one:

*Things are transformed one into another according to necessity,
and render justice to one another according to the order of time.*

“According to the order of time.” From one of the crucial, initial moments of natural science there remains nothing but these obscure, arcane words, this appeal to the “order of time.”

Astronomy and physics have since developed by following this seminal lead given by Anaximander: by understanding how phenomena occur *according to the order of time*. In [4], astronomy described the movements of stars *in time*. The equations of physics describe how things change *in time*. From the equations of Newton, which establish the foundations of mechanics, to those of Maxwell for electromagnetic phenomena; from Schrödinger's equation describing how quantum phenomena evolve, to those of quantum field theory for the dynamics of subatomic particles: the whole of our physics, and science in general, is about how things develop “according to the order of time.”

It has long been the convention to indicate this time in equations with the letter t (the word for “time” begins with t in Italian, French, and Spanish, but not in German, Arabic, Russian, or Mandarin). What does this t stand for? It stands for the number measured by a clock. The equations tell us how things change as the time measured by a clock passes.

But if different clocks mark different times, as we have seen above, what does t indicate? When the two friends meet up again after one has lived in the mountains and the other at sea level, the watches on their wrists will show different times. Which of the two is t ? In a physics laboratory, a clock on a table and another on the ground run at different speeds. Which of the two tells the time? How do we describe the difference between them? Should we say that the clock on the ground has slowed relative to the real time recorded on the table? Or that the clock on the table runs faster than the real time measured on the ground?

The question is meaningless. We might just as well ask what is *most* real—the value of sterling in dollars or the value of dollars in sterling. There is no “truer” value; they are two currencies that have value *relative to each other*. There is no “truer” time; there are two times and they change *relative to each other*. Neither is truer than the other. But there are not just two times. Times are legion: a [5] one for every point in space. There is not one single time; there is a vast multitude of them.

The time indicated by a particular clock measuring a particular phenomenon is called “proper time” in physics. Every clock has its proper time. Every phenomenon that occurs has its proper time, its own rhythm. Einstein has given us the equations that describe how proper times develop *relative to each other*. He has shown us how to calculate the difference between two times. The single quantity “time” melts into a spiderweb of times. We do not describe how the world evolves [6] : we describe how things evolve in local time, and how local times evolve *relative to each other*. The world is not like a platoon advancing at

the pace of a single commander. It's a network of events affecting each other.

This is how time is depicted in Einstein's general theory of relativity. His equations do not have a single "time"; they have innumerable times. Between two events, just as between the two clocks that are separated and then brought together again, the duration is not a single one. Physics does not describe how things evolve "in time" but how things evolve in their own times, and how "times" evolve relative to each other. Time has 7 its first aspect or layer: its unity. It has a different rhythm in every different place and passes here differently from there. The things of this world interweave dances made to different rhythms. If the world is upheld by the dancing Shiva, there must be ten thousand such dancing Shivas, like the dancing figures painted by Matisse.

[Adapted from Carlo Rovelli, *The Order of Time* (English translation 2018)]

- (1) From the words in the box below, choose the most appropriate one to complete each of the following six sentences. You must NOT use any of the words more than ONCE.

- 1 "A platoon advancing at the pace of a single commander" stands in contrast to the metaphor of a _____ in this discussion.
- 2 Anaximander's thought is the origin of how astronomy and physics have come to describe the world. His thought is based on the idea of _____.
- 3 In this text, the single quantity time is equated with _____ time.
- 4 The author asks what t stands for when it is used to indicate time in equations because he wants to discuss the _____ of time.
- 5 The example of two currencies is used to explain the idea that time has no absolute _____.
- 6 The passage supports the idea that time differs depending on the _____ of the location.

A altitude	B currency	C different	D language	E network
F order	G proper	H relativity	I unity	J value

- (2) Choose the FOUR statements below which do NOT agree with what is written in the passage. You must NOT choose more than FOUR statements.

- A Clocks that are placed at a certain altitude tell time more accurately than those at other altitudes.
- B Describing how events evolve over time requires a two-step process based on accounting for local times.
- C In order to describe the evolution of events we need a single clock that can measure every phenomenon with "proper time."
- D Science is based on the assumption that things do not change relative to each other.
- E Ten thousand dancing Shivas holding up the world would be a good metaphor for time in Einstein's general theory of relativity.
- F The Greek philosopher Anaximander's quote suggests that events follow according to necessity.
- G The passage draws an analogy between the valuation of currency and that of time.
- H Two clocks at different altitudes measure different times.
- I When the letter t is used to represent time in equations, it represents a universal time known as "proper time."

(3) Choose the best item to fill each of the numbered boxes

1

 to

7

 found in the passage.

- | | | |
|---------------------------------------|---------------------------------------|-----------------|
| 1 A describe
D prevent | B enforce
E witness | C erode |
| 2 A equal
D numerous | B fewer
E several | C more |
| 3 A centuries
D scores | B decades
E years | C millennia |
| 4 A antiquity
D mythology | B infinity
E rarity | C modernity |
| 5 A different
D misleading | B diminishing
E same | C fluctuating |
| 6 A in local time
D in time | B in relativity
E in variation | C in science |
| 7 A created
D lost | B found
E shown | C ignored |

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