E—1

令和５年度入学者選抜学力検査問題

英　　語

注　意　事　項

1. この冊子は，監督者から解答を始めるよう合図があるまで開いてはいけません。
2. 監督者から指示があったら，解答用紙の上部の所定欄に受験番号と座席番号を，また，下部の所定欄には座席番号をそれぞれ記入しなさい。その他の欄に記入してはいけません。
3. 解答用紙は，記入の有無にかかわらず，持ち帰ってはいけません。
4. この冊子は持ち帰りなさい。
5. 落丁，乱丁または印刷不備があったら申し出なさい。

I 次の記事を読み，その内容にもとづいて問１～６に答えなさい。*がついている表現にはページ下に注があります。

Thomas Edison was famously opposed to sleeping. In an 1889 interview published in *Scientific American*, the ever energetic inventor of the lightbulb claimed he never slept more than four hours a night. Sleep was, he thought, a waste of time.

Yet Edison may have relied on (a)slumber to spur* his creativity. The inventor is said to have napped while holding a [ball] in each hand, presuming that, as he fell asleep, the orbs* would fall to the floor and wake him. (1)This way he could remember the sorts of thoughts that come to us as we are nodding off*, which we often do not recall.

Sleep researchers now suggest that Edison might have been on to* something. A study published recently in *Science Advances* reports that we have a brief period of creativity and insight in the (b)semilucid state that occurs just as we begin to drift into sleep, a sleep phase called N1, or no rapid-eye-movement sleep stage 1. The findings imply that if we can (c)harness that liminal* haze* between sleep and wakefulness — known as a hypnagogic* state — we might recall our bright ideas more easily.

Inspired by Edison, Delphine Oudiette of the Paris Brain Institute and her colleagues presented 103 participants with mathematical problems that had a hidden rule that allowed them to be solved much faster. (2)The 16 people who cracked* the clue right away were then excluded from the study. The rest were given a 20-minute break period and asked to relax in a reclined position while

(注) spur　を刺激する / orb　球形のもの / nod off　うとうとする / be on to　に気付いている / liminal　感知できるか否かの境目にある / haze　ぼやけ / hypnagogic　入眠時の / crack　を解読する

holding a drinking glass in their right hand. If it fell, they were then asked to report what they had been thinking prior to letting go.

Throughout the break, subjects* underwent* polysomnography, a technology that monitors brain, eye and muscle activity to assess a person's state of wakefulness. This helped to determine which subjects were awake rather than in N1 or if they were in N2 — the next, slightly deeper phase of our sleep.

After the break, the study subjects were presented with the math problems again. Those who had dozed* into N1 were nearly three times more likely to crack the hidden rule as others who had stayed awake throughout the experiment — and nearly six times more likely to do so as people who had slipped into N2. This "eureka* moment," as the authors call it, did not occur immediately. Rather it happened after many subsequent* attempts to solve the math problem, which is consistent with previous research on insight and sleep.

It's less clear that Edison's technique of dropping objects to (d)ward off deeper sleep works. Of the 63 subjects who dropped the glass as they drowsed*, 26 did so after they had already passed through N1 sleep. Still, the findings suggest that we do have a creative window just before falling asleep.

Oudiette says that, like Edison, her personal experience with sleep inspired the study. "I've always had a lot of hypnagogic experiences, dreamlike experiences that have fascinated me for a long time," she says. "I was quite surprised that almost no scientists have studied this period in the past two decades."

A study published in 2018 found that a brief period of "awake quiescence*," or quiet resting, increased the odds* of discovering the same mathematical rule

(注)subject　被験者，実験参加者 / undergo　を経験する /
doze　居眠りをする / eureka　見つけた！/
subsequent　それに続く / drowse　うとうとする /
quiescence　休止，休眠 / odds　可能性，確率

used in Oudiette's experiment. And psychologist Penny Lewis of Cardiff University in Wales suggests that both rapid-eye-movement (REM) sleep — the phase in which our eyes dart back and forth* and most dreams occur — and non-REM sleep work together to encourage problem-solving.

Yet for the most part, Oudiette is not aware of any other research specifically looking at the influence of sleep onset* on creativity. She does, however, point to plenty of historical examples of this phenomenon.

"Alexander the Great and [Albert] Einstein potentially used Edison's technique, or so the legend goes," she says. "And some of the dreams that have inspired great discoveries could be hypnagogic experiences rather than night dreams. One famous example is the chemist August Kekulé finding the ring structure of benzene* after seeing a snake biting its own tail in a 'half-sleep' period when he was up working late." Surrealist* painter Salvador Dalí also used a variation of Edison's method: he held a [key] over a metal plate as he went to sleep, which clanged* to wake him as he dropped it, supposedly inspiring his artistic imagery.

"This study gives us simultaneous insight into consciousness and creativity," says Adam Haar Horowitz of the M.I.T. Media Lab, who has devised technology to interact with* hypnagogic states but did not collaborate with Oudiette's team. "Importantly," he adds, "it's the kind of study that you can go ahead and try at home yourself. Grab a metal object, lie down, focus hard on a creative problem, and see what sort of eureka moments you can encounter."

For University of California, Santa Barbara, psychologist Jonathan Schooler, who also was not involved with the project, (3)the study does not necessarily prove

(注)dart back and forth (目が) きょろきょろと動く / onset 始まり /
benzene ベンゼン / surrealist 超現実主義者 /
clang 大きな音を出す / interact with と関わり合う

that just anyone will be able to mine* their creativity during this early phase of somnolence*. As he points out, "residing in the 'sweet* zone' might have also simply refreshed the study participants, making it easier for them to solve the problem later." But Schooler acknowledges there may be something very solid* in the study's findings. "The new results suggest there is a creative sleep sweet spot during which individuals are asleep enough to access otherwise inaccessible elements but not so far gone the material is lost," he says.

Despite its reputation as the brain's period of "shutting off," sleep is, neurologically* speaking, an incredibly active process. Brain cells fire* by the billions, help to reactivate* and store memories, and, it seems, allow us to conjure* our mental creations.

Oudiette hopes not only to confirm her findings in future research but also to determine if focusing on our hypnagogic state might help solve real-world tasks and problems by harnessing the creative potential of that liminal period between sleep and wakefulness. Additionally, she and her group are considering the potential of brain-computer interfaces to precisely identify brain-wave patterns associated with the onset of sleep, allowing the precise identification of when people should be woken up during their moments of putative* insight.

"We could even teach people how to reach this creative state (e)at will," Oudiette envisions*. "Imagine playing sounds when people are reaching the right state and other sounds when they are going too far into sleep. Such a method could teach them how to recognize the creative state and how to reach it."

出典：Bret Stetka, "Nap Like a Genius", *Scientific American* (April 2022), pp.74－77.(一部改変)

(注)mine　掘り出す / somnolence　眠気 / sweet　最適な / solid　堅実な / neurologically　神経学的に / fire　(神経細胞が) 興奮する / reactivate　を復活させる / conjure　を喚起する / putative　想定される，推定上の / envision　を思い描く

問 1　下線部(1)を日本語に訳しなさい。

問 2　下線部(2)のことを行った理由は何ですか。the study の内容を含めて日本語で答えなさい。

問 3　Jonathan Schooler が下線部(3)のように考えた根拠は何ですか。日本語で答えなさい。

問 4　この記事に出てくる ball ／ glass ／ key の共通点は何ですか。本文の内容にもとづいて日本語で答えなさい。

問 5　本文中で直接的に述べられていませんが，37 という数値は何を示しますか。日本語で答えなさい。

問 6　下線(a)～(e)の意味として，本文の文脈に照らして考えて最もふさわしいものをそれぞれA～Dの中から1つ選び，記号で答えなさい。

(a) slumber:

A. lying down　　B. sleeping

C. staying awake　　D. waking up early

(b) semilucid:

A. little-known　　B. partially awake

C. second-half　　D. well-understood

(c) harness:

A. collect　　B. neglect

C. research　　D. utilize

(d) ward off:

A. continue　　B. encourage

C. prevent　　D. wake up

(e) at will:

A. by all means　　B. in the future

C. whenever you want　　D. willingly

Ⅱ　次の文章を読んで，問１～３に答えなさい。①～⑪はパラグラフ番号を表します。*がついている表現にはページ下に注があります。また，本文中の[…]は原文を中略していることを示しています。

① Humans have sought to understand the universe at least since the Cognitive Revolution*. Our ancestors put a great deal of time and effort into trying to discover the rules that govern the natural world. But modern science differs from all previous traditions of knowledge in three critical ways:

a. **The willingness to admit ignorance.** Modern science is based on the Latin injunction* ignoramus — 'we do not know'. It assumes that we don't know everything. Even more critically, it accepts that the things that we think we know could be proven wrong as we gain more knowledge. No concept, idea or theory is sacred and beyond challenge.

b. **The centrality of observation and mathematics.** Having admitted ignorance, modern science aims to obtain new knowledge. It does so by gathering observations and then using mathematical tools to connect these observations into comprehensive theories.

c. **The acquisition of new powers.** Modern science is not content with creating theories. It uses these theories in order to acquire new powers, and in particular to develop new technologies.

② The Scientific Revolution has not been a revolution of knowledge. It has been above all a revolution of ignorance. The great discovery that launched the

(注)the Cognitive Revolution　認知革命　1950年代に始まった知的運動の総称 / injunction　一言

Scientific Revolution was the discovery that humans do not know the answers to their most important questions.

③ Premodern traditions of knowledge such as Islam, Christianity, Buddhism and Confucianism* asserted that everything that is important to know about the world was already known. The great gods, or the one almighty* God, or the wise people of the past possessed all-encompassing* wisdom, which they revealed to us in scriptures* and oral traditions. Ordinary mortals* gained knowledge by delving into* these ancient texts and traditions and understanding them properly. It was inconceivable* that the Bible, the Qur'an* or the Vedas* were missing out on a crucial secret of the universe — a secret that might yet be discovered by flesh-and-blood creatures.

④ Ancient traditions of knowledge admitted only two kinds of ignorance. First, an individual might be ignorant of something important. To obtain the necessary knowledge, all he needed to do was ask somebody wiser. There was no need to discover something that nobody yet knew. For example, if a peasant* in some thirteenth-century Yorkshire village wanted to know how the human race originated, he assumed that Christian tradition held the definitive* answer. All he had to do was ask the local priest.

⑤ Second, an entire tradition might be ignorant of unimportant things. By definition, whatever the great gods or the wise people of the past did not bother to tell us was unimportant. For example, if our Yorkshire peasant wanted to know how spiders weave their webs, it was pointless to ask the

(注)Confucianism 儒教 / almighty 全能の / all-encompassing 包括的な / scripture 聖典 / mortal 人間 / delve into 掘り下げて考える / inconceivable 想像もつかない / the Qur'an コーラン（イスラム教の聖典）/ Veda ヴェーダ（ヒンズー教の聖典）/ peasant 農夫 / definitive 決定的な

priest, because there was no answer to this question in any of the Christian Scriptures. That did not mean, however, that Christianity was deficient. Rather, it meant that understanding how spiders weave their webs was unimportant. After all, God knew perfectly well how spiders do it. If this were a vital piece of information, necessary for human prosperity and salvation*, God would have included a comprehensive explanation in the Bible.

⑥ Christianity did not forbid people to study spiders. But spider scholars — if there were any in medieval Europe — had to accept their peripheral* role in society and the irrelevance of their findings to the eternal truths of Christianity. No matter what a scholar might discover about spiders or butterflies or Galapagos finches*, that knowledge was little more than trivia*, with no bearing on the fundamental truth of society, politics and economics.

⑦ In fact, things were never quite that simple. In every age, even the most pious* and conservative, there were people who argued that there were important things of which their entire tradition was ignorant. Yet such people were usually marginalized* or persecuted* — or else they founded a new tradition and began arguing that they knew everything there is to know. […]

⑧ Modern-day science is a unique tradition of knowledge, inasmuch as* it openly admits collective ignorance regarding the most important questions. […] After centuries of extensive scientific research, biologists admit that they still don't have any good explanation for how brains produce consciousness. Physicists admit that they don't know what caused the Big Bang, or how to

(注) salvation　罪からの救済 / peripheral　重要でない /
Galapagos finch　ガラパゴス島のフィンチ（鳥） / trivia　ささいなこと /
pious　宗教的な / marginalize　を軽んじる /
persecute　を迫害する / inasmuch as　という事実から見て

reconcile* quantum mechanics* with the theory of general relativity*.

⑨ In other cases, competing scientific theories are vociferously* debated on the basis of constantly emerging new evidence. A prime example is the debates about how best to run the economy. Though individual economists may claim that their method is the best, orthodoxy* changes with every financial crisis and stock-exchange bubble*, and it is generally accepted that the final word on economics is yet to be said.

⑩ In still other cases, particular theories are supported so consistently by the available evidence, that all alternatives have long since fallen by the wayside*. Such theories are accepted as true — yet everyone agrees that were new evidence to emerge that contradicts the theory, it would have to be revised or discarded. Good examples of these are the plate tectonics theory and the theory of evolution.

⑪ The willingness to admit ignorance has made modern science more dynamic, supple*and inquisitive* than any previous tradition of knowledge. This has hugely expanded our capacity to understand how the world works and our ability to invent new technologies.

出典：Y. N. Harari, *Sapiens: A Brief History of Humankind* (Harper, 2015), pp. 250－253.(一部改変)

(注)reconcile と折り合いをつける / quantum mechanics 量子力学 / general relativity 一般相対性理論 / vociferously 騒々しく / orthodoxy 正統派の学説 / stock-exchange bubble 株式市場バブル / wayside 道端 / supple 柔軟な / inquisitive 探求的な，詮索好きの

問 1　(1)～(4)の文が本文の内容と合うように，空所に入る適切な語を答えなさい。なお，空所には本文からそのままの形で抜き出した１～３語が入ります。ただし文頭の場合は最初の文字を大文字にしなさい。

(1) _____ are central to modern science's search for new knowledge.

(2) Rather than being a revolution of knowledge, the Scientific Revolution has been a _____.

(3) Before the Scientific Revolution, people believed that all essential knowledge was contained in not only religious writings but also _____, and that if people studied these sources, they would be able to access that knowledge.

(4) Now, scientists agree that even accepted theories would need to be revised if new contradictory _____ were found.

問 2　(1)～(4)の答として最も適切なものをＡ～Ｄから１つ選び，記号で答えなさい。

(1) The word "deficient" in paragraph ⑤ is most similar in meaning to:

Ａ．confusing or complicated

Ｂ．inadequate or incomplete

Ｃ．irrelevant or unimportant

Ｄ．primitive or old-fashioned

(2) Paragraph ⑧ explains that modern-day science

A. has combined ideas from different scientists to explain how the universe works.

B. has found the answers to our most important questions through extensive research.

C. has left us still ignorant about important topics in different scientific fields.

D. has reached a point where no new information is left to be discovered.

(3) Paragraph ⑨ shows that economics

A. can be understood by looking at all the evidence from the history of economics.

B. can tell us the best methods to avoid a financial crisis in the future.

C. gives us examples to help us to understand other areas of science.

D. is a field of knowledge about which we do not yet have a full understanding.

(4) The word "consistently" in paragraph ⑩ means:

A. in a way that is easy to understand

B. in the same way in different cases

C. with many different results

D. without needing any evidence

問 3　(1)～(4)の各文が，本文の内容と合っていればＴ，本文の内容と異なっていればＦ，本文で書かれていないことであればＮＧと答えなさい。

(1) Modern scientists create theories, then make observations, and then use the observations to develop new technology.

(2) In medieval Europe, Christianity did not prevent people from studying by themselves.

(3) The theory of evolution is not accepted as true.

(4) Because people now accept that they do not know everything, they rely on technology too much.

Ⅲ　問１～３に答えなさい。

問 1　(1)～(5)が意味の通る会話になるように，括弧内の単語を並べ替えて空所に入れなさい。**2番目**と**7番目**に来る単語のみ解答用紙に記入すること。

(1)　A：How come you failed the test? Did you answer the essay question properly?

B：I'm not sure. I thought _____ __2__, _____ _____ _____ _____ __7__ wrong.

(**but / did / got / I / I / it / maybe**)

(2)　A：I went for an interview, but they gave the job to the manager's brother.

B：That's not surprising. When you are looking for a job, it's _____ __2__ _____ _____, _____ _____ __7__ _____.

(**but / know / know / not / what / who / you / you**)

(3)　A：You are a bit late. Are you OK?

B：Yes, I just _____ __2__ _____ _____ _____ _____ __7__ building.

(**a / few / finding / had / problems / right / the**)

(4)　A：Have you finished your homework?

B：I'd _____ __2__ _____ _____ _____ _____ __7__ _____ _____ chatting online with my friends.

(**finished / hadn't / have / I / if / it / long / so / spent**)

(5)　A：You are really good at this game. It's _____ __2__ _____ _____ _____ _____ __7__ _____ _____ time playing it.

B：Thanks. It's just beginner's luck.

(**believe / hard / is / only / second / that / this / to / your**)

問 2 (1)～(10)の上下の文が同様の意味になるように，空所に入る3～5語の英語表現を書きなさい。ただし，太字で書かれた単語をそのままの形で含める（ただし文頭で使う場合は最初の文字を大文字にする）こと。語数が不足したり，多すぎたりする場合は不正解となります。

例 He left and didn't even say thank you.

much

He left _____ saying thank you. 答：without so much as

(1) Sam and I are very good friends.

along

Sam and I _____ each other very well.

(2) The forest fire raged for three days until the firefighters were able to extinguish it.

out

The forest fire raged for three days until the firefighters were able to _____.

(3) Ali didn't speak Japanese when she first came to Japan, so I expect she found it difficult to communicate.

must

Ali _____ communication difficult when she first came to Japan because she didn't speak Japanese.

(4) The children were told that it is cruel to laugh at other people for the way they look.

fun

The children were told that _____ the way people look is cruel.

(5) It's important that you give me the message as soon as it arrives, whatever the time.

what

I want you to give me the message as soon as it arrives, _____ it is.

(6) Maybe I accidentally scratched the car with my bag as I went past.

accident

As I went past the car, I may _____ with my bag.

(7) The weather was bad, but Tom decided to go fishing.

despite

_____ bad, Tom decided to go fishing.

(8) If you hadn't checked the time, you might have been late.

for

If _____ your checking the time, you might have been late.

(9) You'll miss the bus if you don't hurry.

time

Unless you hurry, you won't _____ for the bus.

(10) I got home and went to bed immediately.

sooner

_____ got home than I went to bed.

問 3　(1)～(5)の会話中の空所に入る適切な英語表現を書きなさい。右欄に太字で書かれた単語をそのままの形で含め(ただし文頭で使う場合は最初の文字を大文字にする)，指定された数の単語を使用すること。なお，括弧[　]内は会話の状況等を表します。

例 [At home]　　**about** 計3語

Speaker 1 : Have you cleaned your room?

Speaker 2 : Not yet. But I _____.

答 : was about to

(1) [After a test]　　**well** 計3語

Speaker 1 : How did you do in the test?

Speaker 2 : I didn't do _____ I thought I would.

(2) [Sightseeing in Tokyo]　　**anywhere** 計3語

Speaker 1 : Tokyo Skytree is one of the most popular places to visit. It gets more visitors _____ in Tokyo.

Speaker 2 : OK. Let's go there as soon as it opens.

(3) [Shopping]　　**mind** 計4語

Speaker 1 : Which one do you want?

Speaker 2 : I can't _____. Maybe I'll get both of them.

(4) [At school]

check 計4語

Speaker 1 : What did your teacher say about your writing homework?

Speaker 2 : She told _____ more carefully before I hand it in next time.

(5) [Driving]

small 計4語

Speaker 1 : What do you think is most difficult about driving?

Speaker 2 : _____ space. I have quite a big car, so it's difficult to park in spaces that are designed for smaller cars.