H8−2025−英　　語

学科（記述式）試験問題

注　意　事　項

1. 問題は **3 題**で、解答時間は **1 時間 20 分**です。

2. 答案用紙の記入について
   ㋐　答案は濃くはっきり書き、書き損じた場合は、解答の内容がはっきり分かるように訂正してください。また、答案用紙の表側だけで書ききれないときは、「**裏に続く**」と書いて裏側を使用してください。
   ㋑　答案用紙は、表紙を除き **6 枚つづり 1 冊**です。
   ㋒　答案用紙の表紙の各欄にそれぞれ必要事項を記入してください。
   〔　　〕−(　　)−［　　］の欄は〔 H8 〕−(2025)−［**英　語**］と記入してください。
   ㋓　答案用紙各枚の右上の(　ページ)欄に上から順にページ数を記入してください。
   ㋔　下記のとおり指定されたページを使って解答してください。

【問題番号】	(ページ)
【No.　**1**】	(１～２)
【No.　**2**】	(３～４)
【No.　**3**】	(５～６)

   ㋕　答案用紙各枚の左上にある(No.　　)の欄には問題番号を記入してください。
   ㋖　試験の公正を害するおそれがありますので、答案用紙の氏名欄以外に氏名その他解答と関係のない事項を記載しないでください。

3. この問題集は、本試験種目終了後に持ち帰りができます。

4. 本試験種目の途中で退室する場合は、退室時の問題集の持ち帰りはできませんが、希望する方には後ほど渡します。別途試験官の指示に従ってください。なお、試験時間中に、この問題集を切り取ったり、転記したりしないでください。

5. 下欄に受験番号等を記入してください。

第１次試験地	受験番号	氏　　名

指示があるまで中を開いてはいけません。

途中で退室する場合……本試験種目終了後の問題集の持ち帰りを　　**希望しない**

【No. 1】 Read the passage below and answer the questions (1)~(4) that follow **in English**.

Science is really a way of looking at the world — REALLY looking — and then coming up with explanations for why things are as they are. An explanation is accepted as a good scientific theory if it helps scientists correctly predict how nature will behave in the future.

[A], how many thousands of years did humans spend looking up at the night sky before they really saw that some of the "stars" (which were really the planets of the solar system) were in different positions every night, but were always arranged in a straight line across the sky? It took careful observation (and good record keeping) to begin to see the pattern of the planets' movement across the sky and realize that if the Earth and planets were all orbiting the sun (rather than all the objects in the sky orbiting Earth, as had been believed), the movement of the planets could be explained and predicted. No experiment was performed. No variables were controlled. The data gathering came way before the hypothesis (the idea that [B]).

Sometimes science happens mostly inside a scientist's head. For example, when Einstein discovered his Theory of Relativity, he did it by just thinking (and doing a lot of math, no doubt) about how nature ought to work if certain conditions were met. No experiments could be done to test his theory because the technology to test them hadn't been invented yet. Now that we do have some of these technologies, every test that anyone has done to test Einstein's theory has shown it to be correct.

Sometimes, science happens by accident. Some chemical gets spilled onto a material in a workshop or something gets overheated, and a whole new set of chemical properties are discovered. [C] two scientists working on different problems get together for lunch, gripe[*1] to each other about how stuck they are, and one says something that triggers the other one to suddenly see the answer.

So rather than being a tidy package of knowledge or a methodical[*2] step-by-step approach to discovery, science is more like a mystery inviting anyone who is interested to become a detective and join in the fun.

[*1] gripe: to complain about something in an annoying way

[*2] methodical: a methodical way of doing something is careful and uses an ordered system

(1) What does the passage say is a positive effect of casual conversation between scientists? Answer in a sentence of 20 or fewer words.

(2) Fill in the blank [A] with a suitable phrase.

(3) Fill in the blank [B] with a sentence of 10 or fewer words to give the "idea" details.

(4) Fill in the blank [C] with a suitable word.

【No. **2**】 次の文章を読み、問い(1)～(5)に日本語で答えよ。

The wings of a Morpho butterfly look glistening and blue, and this deep iridescent[*1] blue is even more dazzling in real life. Yet they are, according to any sort of chemical analysis, completely colorless. Nothing in them is truly blue. The mystery of how light that is the color of satiny[*2] sky can radiate from translucent[*3] material has puzzled scientists since Newton. (1)The dilemma is simple: how can something be produced from nothing? As is often the case with science, the answer has been there all along but simply took a while to find, as scientists needed powerful microscopes to make the discovery. When they at last brought the wings into focus beneath a lens, the lurking[*4] cause of color emerged: scales. The wings were blanketed in millions of scales.

Of course, (2)this doesn't seem like an answer at all. How can translucent scales, even quite a lot of them, create color? There must be some element inside them that exudes[*5] blue. As it turns out, it is not the miniature tiles themselves but their configuration that matters.

A butterfly's wings may be covered by two, three, or more layers of scaly[*6] sheets. The layers are stacked and strengthened by microscopic arches and columns like a miniature Roman city. When a ray of light strikes a wing, some of it bounces directly off the top level of scales. Some of it passes through the first layer and bounces off a lower level.

《中　略》

The butterfly wishes to accept every color contained in light from the sun and to return to the world only a single, intense blue. (3)This is where the stacked city of scales on its wings comes in quite handy. It was built not for Romans but for light waves, which are nano-tiny, just a series of photons strung together. But the intricate structures refuse to accommodate all light waves — they were built just for a select wave size, the size that looks blue. Other waves (from pale purple to strong red) are too small or too large to play in the jungle gym of levels stretched across the wings. Constructed specifically to cater to one wavelength alone, the Morpho's wings were destined to flash blue from the womb (or, more accurately, the cocoon).

《中　略》

It is almost impossible to believe that these small fluttering[*7] organisms — full of soft material and random variations in size and shape — are invariably able to grow optical marvels upon themselves. (4)It is even more unbelievable that nature alone produces these extremely precise arrays, which are still to this day too complex for humans to manufacture using machines. In a contest of optics between modern science and a butterfly, nature would win.

*1 iridescent: showing many bright colors that seem to change in different lights

*2 satiny: having or resembling the soft, usually lustrous smoothness of satin

*3 translucent: allowing light to pass through but not completely clear

*4 lurking < lurk: to lie hidden

*5 exude: to display conspicuously or abundantly

*6 scaly: covered with, composed of, or rich in scale or scales

*7 fluttering < flutter: to flap the wings rapidly

(1) 下線部(1)の something と nothing は、それぞれ何を指しているか、説明せよ。

(2) 下線部(2)の this は何を指しているか、具体的に書け。

(3) 下線部(3)を和訳せよ。

(4) 下線部(4)を和訳せよ。

(5) モルフォ蝶の羽はなぜ青く見えるのか。この文章の記述を要約して、100 字以内で説明せよ。

【No.　**3**】 次の文章を読み、下線部(1)、(2)、(3)を英訳せよ。

著作権の関係のため、掲載できません。

＜出典＞

・No.1

What Do You Think It Is? Reproduced with permission of National Oceanic and Atmospheric Administration

・No.2

Butterfly Wing Optics by Julia Rothchild, STEMvisions Blog, Sep 4, 2025.