氏　名　　受験番号

平成29年度

入学試験問題

英　語

注意：第１問から第３問まではマークシートに解答しなさい。
第４問と第５問は記述用解答用紙に解答しなさい。

マークシートの記入について（注意事項）

1. 解答の作成にはH、F、HBの鉛筆を使用して正しくマークすること。
   よい解答例 ●（正しくマークされている）
   悪い解答例 ◉ ⊖（マークが部分的で解答とみなされない）
2. 解答を修正する場合は、必ず「プラスチック製消しゴム」であとが残らないように完全に消すこと。
   鉛筆の色が残っていたり、「 」のような消し方などをした場合は、修正したことにならないので注意すること。
3. 解答用紙は、折り曲げたりメモやチェック等で汚したりしないよう特に注意すること。
4. 受験番号欄の記入方法《 受験番号記入例（右図）参照 》
   ① 受験番号を数字で記入する
   ② 受験番号の数字を正しくマークする
   正しくマークされていない場合、採点できないことがあります。

－ 受験番号記入例 －
受験番号1001の場合

受験番号欄			
千位	百位	十位	一位
1	0	0	1
⓪	●	●	⓪
●	①	①	●
②	②	②	②
③	③	③	③
④	④	④	④
⑤	⑤	⑤	⑤

注：選択する数字は『0』から順番に並んでいます。

藤田保健衛生大学医学部

第１問から第３問では、問題文の中の [　　] 内の数字はマークシートの問番号を示している。該当する問番号の解答記入欄に答をマークしなさい。

第１問　次の問 1～6 の空所 [　1　]～[　6　] に入れるのに最も適切なものを (1)～(4) から１つ選び、その番号をマークしなさい。

問 1.　Only a few of them anticipated [　1　] such a great number of people in the party.

(1) being there　(2) there being　(3) there to be　(4) to be there

問 2.　I am very ashamed that I mistook him [　2　] his father.

(1) by　(2) for　(3) from　(4) with

問 3.　[　3　] you graduated from a famous university doesn't matter at all.

(1) If　(2) Unless　(3) What　(4) Whether

問 4.　In the sky, there was nothing but clouds as [　4　] as the eye could see.

(1) far　(2) long　(3) many　(4) much

問 5.　I got paid yesterday, but I have [　5　] 100 dollars now.

(1) any more than　(2) at least　(3) at most　(4) no less than

問 6.　Your decision seems quite firm. If you [　6　] your mind, let me know.

(1) changed　(2) had changed　(3) should change　(4) were to change

第２問　次の問 1～4 においては、それぞれ日本語の意味に合うように下の (1)～(7) の語句を並べかえて空所を補い、最も適切な文を完成させなさい。解答は [7]～[14] に入れるものの番号のみをマークしなさい。ただし文頭にくる文字も小文字にしてある。

問 1.　電子マネーを使えば、小銭を持ち歩かなくても済むようになるだろう。

____ ____ [7] ____ ____ [8] ____.

(1) carrying　(2) coins　(3) electronic money　(4) of
(5) people　(6) the trouble　(7) will save

問 2.　もう少し詳しく話しておいたほうがよかったかもしれない。

I ____ [9] ____ ____ [10] ____ ____ in more detail.

(1) about　(2) as　(3) have　(4) it
(5) might　(6) talked　(7) well

問 3.　成功をおさめた人は時間を最大限に活用する。

____ [11] ____ ____ [12] ____ ____ their time.

(1) have achieved　(2) make　(3) of　(4) success
(5) the most　(6) those　(7) who

問 4.　雨が降り出すまで、傘を列車に忘れてきたことに気が付かなかった。

____ ____ [13] ____ ____ [14] ____ of having left my umbrella on the train.

(1) aware　(2) I　(3) it　(4) not until
(5) raining　(6) started　(7) was

第3問 *Dog Intelligence and What It Can Tell Us about Our Own Intelligence* という表題の次の英文を読み、後の問いに答えなさい。

If you're a true dog lover, you take it as one of life's simple truths that all dogs are good, and you have no patience for scientific debate over whether dogs really love people. Of course they do. What else could explain the fact that your dog runs wildly in circles when you get home from work, and, as your neighbors report, howls inconsolably for hours on end when you leave? What else could explain the fact that [X]? At the same time, there's no denying that some dogs are smarter than others. Not all dogs can, like a border collie mix named Jumpy, do a back flip, ride a skateboard, and weave through pylons on his front legs.

A study published in the journal *Intelligence* by British psychologists Rosalind Arden and Mark Adams confirms as much. Consistent with over a century of research on human intelligence, Arden and Adams found that a dog that excels in one test of cognitive ability (あ) in other tests of cognitive ability. In more technical terms, the study reveals that there is a general factor of intelligence in dogs—a canine "g" factor.

For their study, Arden and Adams devised (A)a battery of canine cognitive ability tests. All of the tests revolved around—you guessed it—getting a treat. In the *detour test,* the dog's objective was to navigate around barriers arranged in different configurations to get to a treat. In the *point-following test,* a researcher pointed to one of two inverted beakers concealing a treat, and recorded whether the dog went to that beaker or the other one. Finally, the *quantity discrimination test* required the dog to choose between a small treat (a glob of peanut butter) and a larger one (the "correct" answer). Arden and Adams administered the battery to 68 border collies from Wales; [Y].

Just as humans will differ in their scores on intelligence tests, [Z]. Some of the dogs aced the tests; others struggled. The maze version of the detour test was especially tricky for some of the dogs. In this test, the dog had to navigate through a maze and then crawl through a plastic tube to get the treat. While the best performer took just 3 seconds to complete this task, the worst took nearly 2 minutes. Moreover, scores on the tests tended to correlate positively with one another, implying the existence of a canine g factor. For example, a dog that did well in the quantity discrimination test, consistently preferring the larger glob of peanut butter to the smaller one, tended to do well in the pointing test, consistently going where the researcher pointed.

This research suggests that neural mechanisms underlying variation in intelligence may be similar across the animal kingdom. Other research has found evidence for a g factor in mice and monkeys; there are even hints of g in insects. On a more practical level, this research is important for understanding the link between intelligence and health in humans. Research has convincingly established that scores on intelligence tests predict health outcomes. A high IQ is associated with good health and a long life. However, interpretation of this finding is complicated by the fact that IQ may also correlate with "confounding" behaviors such as drinking and smoking. Because (B)dogs refrain from these behaviors,

research on canine intelligence can give scientists a more accurate estimate of the relationship between health and intelligence. This is yet another way that dogs are our best friends.

http://www.scientificamerican.com/article/dog-intelligence-and-what-it-can-tell-us-about-our-own-intelligence（改変あり）

注
howl: 遠ぼえする
back flip: 後方宙返り
canine: イヌの
inverted: 逆さにした
maze: 迷路
inconsolably: 悲しげに
weave: 縫って進む
a battery of: 一連の
glob: ひとかけら
"confounding" behavior:「交絡」行動
border collie: ボーダーコリー（牧羊犬）
pylon: コーン（円錐形の標識）
configuration: 配置
ace: 優れた成績を収める

問 1. 空所 [X]、[Y]、[Z] には次の①～③のいずれかが入る。最も適切な組み合わせを示しているものを (1)～(6) から１つ選び、その番号を [15] にマークしなさい。

① all had been bred and trained to do herding work on a farm, and thus had similar backgrounds
（注 herding work: 牧羊）
② the dogs differed in their performance on the tests
③ your dog insists on sleeping in your bed, under the covers—in between you and your partner

(1) X: ①, Y: ②, Z: ③
(2) X: ①, Y: ③, Z: ②
(3) X: ②, Y: ①, Z: ③
(4) X: ②, Y: ③, Z: ①
(5) X: ③, Y: ①, Z: ②
(6) X: ③, Y: ②, Z: ①

問 2. 空所(あ)に入れるのに最も適切な表現を (1)～(4) から１つ選び、その番号を [16] にマークしなさい。

(1) will always excel
(2) will always fall behind
(3) will likely excel
(4) will likely fall behind

問 3. 下線部《A》のテストで調査されなかった認知能力を述べているものを (1)～(4) から１つ選び、その番号を [17] にマークしなさい。

(1) the cognitive ability to distinguish a larger treat from a smaller one
(2) the cognitive ability to get to a goal successfully through a complicated route
(3) the cognitive ability to go to a place indicated by a researcher
(4) the cognitive ability to lead other dogs along the correct route to a goal

問 4. 下線部《B》と最も近い意味を表すものを (1)〜(4) から１つ選び、その番号を [18] にマークしなさい。

(1) dogs do not improve these behaviors
(2) dogs do not show these behaviors
(3) dogs perform these behaviors
(4) dogs repeat these behaviors

問 5. 「犬の知能に関する研究」と「人間の知能と健康の結びつきに関する研究」との関連についての本文の記述を最も適切に述べているものはどれか。(1)〜(4) から１つ選び、その番号を [19] にマークしなさい。

(1) Research on canine intelligence can contribute to scientists' understanding of the link between intelligence and health in humans.
(2) Research on canine intelligence cannot help scientists to understand the link between intelligence and health in humans.
(3) Research on the link between intelligence and health in humans can contribute to scientists' understanding of canine intelligence.
(4) Research on the link between intelligence and health in humans cannot help scientists to understand canine intelligence.

問 6. 本文の内容に合致するものを (1)〜(5) から２つ選び、それらの番号をそれぞれ [20]、[21] にマークしなさい（順不同）。

(1) True dog lovers are eager to debate whether dogs really love people.
(2) It is very clear that dogs are not uniform in their level of intelligence.
(3) Through the study done by Arden and Adams, it was revealed that dogs really love people.
(4) In the maze version of the detour test, no dog could get to the goal within 5 seconds.
(5) It was shown that some animals other than dogs have a general factor of intelligence.

この後の第４問と第５問は記述用解答用紙に解答しなさい。

第４問　次の英文を読み、後の問いに答えなさい。

If you shatter a bone in the future, a 3D printer and some special ink could be your best medicine. Researchers have created what they call "hyperelastic bone" that can be manufactured on demand and works almost as well as the real thing, at least in monkeys and rats. Though not ready to be implanted in humans, bioengineers are optimistic that the material could be a much-needed leap forward in quickly mending injuries ranging from bones wracked by cancer to broken skulls.

【　あ　】

"This is a neat way to overcome the challenges we face in generating bone replacements," says Jos Malda, a biomaterials engineer from Utrecht University in the Netherlands who was not involved in the work. "The scaffold is simpler to make than others and it offers more benefits."

【　い　】

Surgeons currently replace shattered or missing bones with a number of things. The most common option is an autograft, where a piece of bone is taken from a patient's own body, usually from a hip or a rib, and implanted where it's needed elsewhere in that same patient's skeleton. Surgeons prefer autografts because they're real bone complete with stem cells that give rise to cartilage and bone cells to provide extra support for the new graft. (Humans can't regrow entire skeletons from scratch with stem cells, but existing bone can signal stem cells where to grow and what to grow into.) What's more, because the new bone replacement comes from a patient's own body, there's no risk of immune rejection. But only so much of a person's skeleton is available for grafting, and doing so tacks on another painful surgery and recovery for the patient.

【　う　】

Or, at least, that's how it *should* work—unlike in an autograft, stem cells don't always turn into the needed bone or cartilage because of the scaffolds' material makeup. Researchers have gotten stem cells to grow on a ceramic material called calcium phosphate (CaP), but this scaffold is stiff and brittle, making it difficult to implant into patients. To make matters worse, the immune system occasionally sees these scaffolds as foreign and attacks them, preventing any bone growth at all. And if a scaffold is to be used to regenerate small bones, such as many of those found in the

face, for example, doctors worry that it would take too much time and money to make them from CaP.

【 え 】

Researchers at Northwestern University, Evanston, in Illinois are working on a material to remedy all of these issues. Their hyperelastic bone is a type of scaffold made up of hydroxyapatite, a naturally occurring mineral that exists in our bones and teeth, and a biocompatible polymer called polycaprolactone, and a solvent. Hydroxyapatite provides strength and offers chemical cues to stem cells to create bone. The polycaprolactone polymer adds flexibility, and the solvent sticks the 3D-printed layers together as it evaporates during printing. 《A》The three materials are blended into an ink that is dispensed by the printer, layer by layer, into exact shapes matching the bone that needs to be replaced. The idea is, a patient would come in with a nasty broken bone—say, a shattered jaw—and instead of going through painful autograft surgeries or waiting for a custom scaffold to be manufactured, he or she could be x-rayed and a 3D-printed hyperelastic bone scaffold could be printed that same day.

【 お 】

"We're printing flexible scaffolds that will encourage bone to grow through and around them," says Ramille Shah, a material science engineer and co-author on the study.

【 か 】

To test their material, the team first tested their 3D-printed scaffold as a material to fuse spinal vertebrae in rats. Their goal was to see whether their material could lock two adjacent vertebrae in place as well as other scaffolds commonly used to treat spinal injury patients. Eight weeks after the Northwestern researchers implanted the hyperelastic bone, they found that new blood vessels had grown into their scaffold—a necessary step to keep bone-forming tissue alive—and calcified bone started to form from the rats' existing stem cells. The combination fused the vertebrae more efficiently than the controls that received either a bone graft from a donor or nothing at all, the researchers report today in *Science Translational Medicine*.

【 き 】

Because the ink materials—that is, hydroxyapatite along with the polymer and solvent—are commonly used in biomedical engineering labs, Malda says, hyperelastic bone would be cheap to print. What's more, the researchers were able to create the scaffolds lightning-quick by 3D-printing standards, in less than 5 hours for each one. That means future scaffolds could be printed to exact specs, which would be useful in facial reconstruction, or printed into sheets that surgeons could cut and paste into the shape they want. Shah says, "《B》The sky's the limit for this material's applications."

Still, the work needs to be replicated many more times before being implemented in humans, says Scott Hollister, a biomedical engineer at the University of Michigan, Ann Arbor, who was not involved with the study. If it is, that could be a boon for patients around the globe. "The ability to easily print customizable implants is a big advance and would offer a lot of opportunities in areas from plastic surgery to tumor removal and repair."

http://www.sciencemag.org/news/2016/09/print-demand-bone-could-quickly-mend-major-injuries (改変あり)

注 wrack: 壊す　scaffold: 足場　stem cell: 幹細胞　cartilage: 軟骨
graft: 移植（片）　tack on: 追加する　phosphate: リン酸塩　brittle: もろい
hydroxyapatite: 水酸化リン灰石　solvent: 溶媒　evaporate: 蒸発する
nasty: ひどい　fuse: 融合させる　spinal vertebra: 脊椎骨　adjacent: 隣接した
calcify: 石灰化する　control: 対照個体　replicate: 繰り返す　boon: 利益
plastic surgery: 形成外科手術　tumor: 腫瘍

問 1. autograft の２つの利点と２つの欠点を、本文の内容に即して、日本語で答えなさい。

問 2. CaP を用いた scaffold の欠点を３つ、本文の内容に即して、日本語で答えなさい。

問 3. 下線部《A》を和訳しなさい。

問 4. Northwestern 大学の研究チームによって hyperelastic bone を移植されたラットにはどのようなことが起こったか、本文の内容に即して、日本語で答えなさい。

問 5. 下線部《B》の表す意味を本文で述べられている具体例を挙げて、日本語で答えなさい。

問 6. 次の (1) と (2) の段落はそれぞれ本文のどの位置に置くのが最も適切か、【あ】～【き】の記号で答えなさい。

(1) Another bone replacement option is creating a scaffold for bone to grow on. When inserted into the body, stem cells latch onto the structure and differentiate into cells that start to build bone, much as construction workers assemble walls, floors, and glass around a skyscraper's steel girders.

注 latch onto: つかまえる differentiate: 分化する skyscraper: 高層ビル
steel girder: 鉄骨

(2) The researchers also used hyperelastic bone to repair a macaque monkey's damaged skull. After 4 weeks with a hyperelastic bone implant, the scaffold was infiltrated with blood vessels and some calcified bone. Equally important, the macaque didn't suffer from any adverse biological effects, such as inflammation or infection, that many synthetic implants can cause.

注 macaque monkey: マカクザル infiltrate: 侵入させる inflammation: 炎症

第５問　次の英文を読み、下線部 (1)～(4) の日本語を英訳しなさい。

Does smoking alleviate stress? That's the question one reader asked, so the Mainichi looked into the issue.

The reader, a Tokyo man in his 50s, asked, "I've heard that smoking reduces stress and it's better for a smoker's health to continue smoking. Is this true?"

To answer this question, the Mainichi Shimbun turned to Masato Kano, a doctor and clinical psychologist specializing in guidance to help people quit smoking at Hoyukai Shinnakagawa Hospital in Yokohama.

The conclusion? Smoking does not reduce stress. (1)喫煙後にストレスが軽減したと感じられるのは単なる幻想に過ぎない。 It is the result of nicotine alleviating withdrawal symptoms like irritation, difficulty in concentrating and restlessness.

How was a cigarette the first time you tried it? Usually, first-time smokers only feel bad and don't derive any pleasurable feelings from it. This is because just introducing nicotine into the body does not improve one's mood. This contrasts with alcohol, which even in the first ingestion can intoxicate a person.

When a person continues smoking, their brain becomes lazy and does not as readily release dopamine, a brain hormone that is involved with feelings of happiness. (2)体内のニコチンが切れると、禁断症状によって食事から仕事に至る生活全般において満足感が得られなくなる。 When the person then smokes, they resupply the nicotine in their body and gain a sense of satisfaction for a time.

(3)これはとてもきつい靴を脱いだ時に得られる解放感に似ている。 But we do not say "tight shoes relieve foot stress."

Rather, if a person stops smoking, the usual stress caused by nicotine withdrawal symptoms will disappear, and their mental health will improve. Kano says he often hears from his patients who quit smoking that they have less trouble in their interactions with other people, and while driving they are kinder toward pedestrians and other drivers.

(4)喫煙者のおよそ半分が喫煙に関わる病気で早く死ぬということが知られているので、喫煙を続けるよりも禁煙した方が健康によい。 Even if smoking did alleviate stress, since it is bad for the health it would be a case of mistaken priorities. Nicotine withdrawal symptoms last only a week at most. You can definitely quit.

http://mainichi.jp/english/articles/20160814/p2a/00m/0na/008000c（改変あり）

注　alleviate: 緩和する　restlessness: 落ち着きのなさ　ingestion: 摂取　intoxicate: 酔わせる