受 験 番 号

平成26年度

入学試験問題

英　　語

注意：答えはすべて解答用紙に記入しなさい。

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第１問　次の英文を読んで、後の問いに答えなさい。

In 1893 Emil von Behring was busy investigating the properties of diphtheria toxin, the biochemical by-product of diphtheria bacteria that is [　あ　] the disease of the same name. This toxin acts as a kind of poison to normal tissues. A few years earlier von Behring and his colleague Shibasaburo Kitasato had performed an experiment that showed that immunity to diphtheria was [　い　] antitoxin elements, "antibodies," in the blood. What von Behring did not expect to find in his studies on diphtheria toxin — but to his surprise did find — was this: some animals given a *second* dose of toxin too small to injure an animal when given as a *first* dose, nevertheless had drastically exaggerated harmful responses to the tiny second dose. In some cases the response to the puny second dose was so overwhelming as to cause death. Von Behring 《A》coined the term 'hypersensitivity' (*Überempfindlichkeit,* in German) to describe this exaggerated reaction to a small second dose of diphtheria toxin. This experimental finding was so odd relative to the rest of immunological science at the time that it was essentially ignored for about ten years.

In 1898, Charles Richet and Jules Hericourt reported the same finding, this time with a toxin derived from poisonous eels. It too was noted and then ignored. Then in 1902 Paul Portier and Richet published an experimental result that caught the sustained attention of other immunologists. They reported the same exaggerated response to a second small dose of poison derived from marine invertebrates. [　　う　　] was their careful and detailed description of the hypersensitive response as an observable form of cardiovascular shock. Richet and Portier worked in France rather than in Germany, unlike von Behring, and a good deal of political tension and professional animosity existed between those two leading centers of immunological research. The French scientists weren't about to use a term like 'hypersensitivity' 《A》coined by a German, so they called the exaggerated response *anaphylaxis* (to highlight its harmful aspects as contrasted with *prophylaxis*, the medical term for 'protection').

During the next decade a host of prominent immunologists systematically investigated the nature of anaphylaxis, both its qualitative and its quantitative aspects. In 1903 Maurice Arthus performed the experiments that would result in the discovery of the phenomenon named [　え　] him: The Arthus reaction is a characteristic skin lesion formed by the intradermal injection of certain kinds of proteins. In 1906 Clemens von Pirquet and Bela Schick studied 《B》serum sickness, the unfortunate phenomenon whereby a small percentage of persons given standardized diphtheria or tetanus shots, which do not harm a majority of recipients, nevertheless become extremely sick from the shots. They argued that the observational evidence pointed to an immunological cause of serum sickness. To have a convenient way of referring to any medical condition in which otherwise harmless or beneficial substances paradoxically produce illness in certain persons who

come into contact with them, von Pirquet and Schick 《A》coined the term *allergy* (from the Greek *allos ergos*, altered working). In the same year, Alfred Wolff-Eisner published a textbook on hay fever in which he presented the evidential case for hay fever being a form of hypersensitivity traceable to the immune system. In 1910 Samuel Meltzer made the same kind of case for asthma as a form of immunological hypersensitivity somehow localized in the lung tissues.

Notice in this account of the early days of modern immunology how a surprising observational mystery is first [お], then perhaps [か], and eventually [き]. Not all observational mysteries are happily resolved in such a way (some are ignored permanently); but in a large number of cases the course a given area of science takes does seem *evidence driven* in a way many other forms of knowledge gathering are not driven by observational evidence. 《C》Scientific claims deliberately run a risk: the risk of being shown to be false. Some philosophers of science have seen in this at-risk status an important contrast with other forms of human belief such as political ideology, theological doctrines, and so on.

Robert Klee, *Introduction to the Philosophy of Science: Cutting Nature at Its Seams*, 1997（一部改変）

注 diphtheria toxin: ジフテリア毒素
hypersensitivity: 過敏症
cardiovascular: 心臓血管系の
intradermal injection: 皮内注射
hay fever: 枯草熱，花粉症
antibody: 抗体
eel: ウナギ
animosity: 敵意
tetanus: 破傷風
asthma: ぜんそく
puny: 微量の
invertebrate: 無脊椎動物
lesion: 病変
allergy: アレルギー
theological: 神学的

問 1. 空所 [あ]、[い] に入る表現として最も適当なものをそれぞれ１つ選び、その番号を答えなさい（同じものを２度使ってはいけない）。

(1) destroyed by　(2) due to　(3) prevented from　(4) responsible for

問 2. von Behring はジフテリア毒素を同じ動物に２度にわたって投与する実験をおこなった。初回の投与でその動物に害を与えるのに必要な毒素の量を基準量として、２度目の投与において【 ア 】毒素を与えてみると、そのときの反応は【 イ 】。

(a) 基準量より多い　(b) 基準量と同じ量の　(c) 基準量より少ない
(d) 予想通りであった　(e) 予想より強かった　(f) 予想より弱かった

上の空所【 ア 】と【 イ 】には、それぞれ (a)〜(f) のいずれかが入る。最も適当な組み合わせを次の (1)〜(9) から１つ選び、その番号を答えなさい。

(1)：ア-(a)　イ-(d)　(2)：ア-(a)　イ-(e)　(3)：ア-(a)　イ-(f)
(4)：ア-(b)　イ-(d)　(5)：ア-(b)　イ-(e)　(6)：ア-(b)　イ-(f)
(7)：ア-(c)　イ-(d)　(8)：ア-(c)　イ-(e)　(9)：ア-(c)　イ-(f)

問 3. 下線部《A》(3 カ所ある) の 'coined' に最も近い意味の語を 1 つ選び、その番号を答えなさい。

(1) criticized　(2) discarded　(3) invented　(4) used

問 4. 空所 [　う　] には次の (1)〜(5) の語句をある順序に並べた表現が入る。2 番目と 4 番目に入る語句の番号を答えなさい (文頭にくる文字も小文字にしてある)。

(1) distinguished
(2) first described nine years earlier
(3) their report of the same phenomenon
(4) von Behring
(5) what

問 5. 空所 [　え　] に入る表現として最も適当なものを 1 つ選び、その番号を答えなさい。

(1) after　(2) in　(3) to　(4) with

問 6. 下線部《B》の serum sickness(血清病)の説明として最も適当なものを 1 つ選び、その番号を答えなさい。

(1) 1 度目の接種では害のない血清が 2 度目の接種では害をおよぼすという、一部の人にみられる現象

(2) ほとんどの人にとっては適量である血清接種量が、一部の人にとっては不足であり、効果を発揮せずに病気が起こってしまう現象

(3) ほとんどの人にとっては適量である血清接種量が、一部の人にとっては過剰であり、有害な影響をおよぼす現象

(4) ほとんどの人にはなんら害のない血清が、免疫上の理由によって一部の人に対して有害な影響をおよぼす現象

問 7. 空所 [お]、[か]、[き] にはそれぞれ次の (a)、(b)、(c) のいずれかが入る。各空所に入るものの組み合わせとして最も適当なものを１つ選び、その番号を答えなさい。

(a) ignored for a bit　　(b) noted　　(c) set upon with experimental frenzy

（注　frenzy: 熱狂）

(1) : お- (a)　か- (b)　き- (c)　　(2) : お- (a)　か- (c)　き- (b)

(3) : お- (b)　か- (a)　き- (c)　　(4) : お- (b)　か- (c)　き- (a)

(5) : お- (c)　か- (a)　き- (b)　　(6) : お- (c)　か- (b)　き- (a)

問 8. 下線部《C》を日本語にしなさい。

問 9. 本文の内容と一致するものを２つ選び、その番号を答えなさい。

(1) von Behring は過敏症という現象を発見したが、それがその後、北里柴三郎と共同での抗体の研究へとつながっていった。

(2) von Behring が発見した過敏症という現象はしばらくのあいだ無視されたが、後に広く関心をもたれて、組織的な免疫学研究へと発展していった。

(3) 同じ現象を指すのに 'hypersensitivity' と 'anaphylaxis' という２つの語が存在した背景には、ドイツとフランスという免疫学研究の２つの中心地の間の敵対関係があった。

(4) 枯草熱やぜんそくは過敏症の一種ではあるが、免疫系の働きに関係する過敏症とは異なったタイプのものである。

(5) 一部の科学哲学者の考えでは、科学と政治イデオロギーの相違は、自然界を対象とするか人間社会を対象とするかという扱う対象の違いに根ざしている。

第２問　次の英文を読んで、後の問いに答えなさい。

If babies weren't so smart, they'd be incredibly dumb. The baby brain is perhaps the world's greatest learning machine, but it starts out almost entirely empty — particularly concerning the basic way the world works. Babies drop something they're enjoying eating or playing with partly because they have no reason to expect [　ア　]. Gravity comes as something of a surprise.

Equally unexpected to them is the fact that when a thing drops out of sight, [　イ　]. The idea that a person who leaves the room, a toy that's been covered by a blanket, a face that's hidden by peek-a-boo hands still exists — even if invisibly — is known as object permanence. Humans and most of the great apes get a grasp of object permanence early on, an ability that was always thought to make us unique among all of the other species of the world. Now, however, [　ウ　], decidedly different critter: cockatoos. According to a study in the *Journal of Comparative Psychology* by a team of researchers at the University of Vienna and Oxford University, cockatoos not only can master object permanence but also can apply it in surprisingly sophisticated ways.

It was in the 1950s that Swiss psychologist Jean Piaget first began exploring the concept of object permanence in babies, mostly by allowing a baby to see a toy, then covering it up in some way and looking at the age at which children tried to move whatever was concealing it (　あ　) crying in frustration or looking away in seeming acceptance that the thing was now forever lost. By age 2, nearly all babies get it.

That simple knowledge leads to other kinds of basic skills — the ability to track a hidden object as it is moved around, like the carnival game in which a ball is concealed by one of three cups that are then shuffled around on a table. More sophisticated still is the idea of spatial trajectory — watching a car enter one of three tunnel entrances, say, and knowing not only the exit from which the car will emerge but also roughly when [　エ　].

Cockatoos belong to an order of birds that includes parrots and other species, many of which have exhibited surprising cognitive skills, including elaborate play behavior and clever object manipulation — a first step toward tool use. To determine if cockatoos might also have some sense of object permanence, the scientists administered four tests to a group of eight adult birds. The first was a basic Piaget test, in which food was shown to the birds and then hidden behind one of three screens; if the cockatoos went to the trouble to look for it, it would indicate that they knew it was still there somewhere. The result? So-so. Only two of the eight adult birds could complete the task.

The remaining tests were harder. In the first, the cockatoos saw food being hidden under one of three cups and then had to play the carnival game — which the researchers call 《A》the transposition test. In the second, the straightforwardly named rotation test, the birds again knew where the food was, but (い) to new positions. In the third test, the translocation task, the platform stayed still, but the birds themselves were lifted and carried to different positions.

All of the subject birds easily solved the carnival task, even after multiple swaps of cup position. Human children don't get it till age 3 or 4. Nonhuman apes understand it earlier, but can master only a single swap. The cockatoos also solved the translocation task, something human babies who are carried to new positions around a hidden object can't keep up with until age 3 or 4. The rotation task takes babies even longer, but the birds 《B》nailed that one too.

It's not certain why cockatoos are so good at these kinds of object-permanence skills, but the scientists speculate that it has powerful survival benefits — ones that could suggest similar abilities in a lot of other birds. "We assume that the ability to fly and prey upon or avoid being preyed upon from the air is likely to require pronounced spatial-rotation abilities," said Oxford behavioral ecologist Auguste von Bayern, one of the authors of the study.

Humans, as earthbound species, never would have needed the same talents, and to the extent that we had them, we probably let them 《C》languish since we rarely hunt for our food anymore and are never hunted ourselves. Looking for fixed objects in a stationary environment, however, is an ability we need all the time, and so we acquire it early. Smart in one world is not always smart in another, and now and then, like it or not, the beasts are going to beat us.

http://science.time.com/2013/07/30/is-your-baby-as-smart-as-a-cockatoo-maybe-not/（一部改変）

注 critter: 動物　cockatoo: バタン(オウムの仲間)　trajectory: 軌道
cognitive: 認知的　administer: 行う　swap: 交換
prey upon: 捕食する　pronounced: 際立った　stationary: 静止した

問 1. 空所 [ア] ～ [エ] にはそれぞれ次の (1)～(4) のいずれかが入る。各空所に入るものの番号を答えなさい。

(1) it appears that we've been joined by another
(2) it doesn't drop out of existence too
(3) it will reappear based on its speed
(4) it won't just hover where they release it

問 2. (あ) に入れるのに最も適切なものを 1 つ選び、その番号を答えなさい。

(1) as opposed to　(2) as well as　(3) for the sake of　(4) in terms of

問 3. 下線部《A》の the transposition test ではバタンのどのような能力が試されたのか、30 字以内の日本語で説明しなさい。

問 4. (　い　) には次の(1)～(6)の語句をある順序に並べた表現が入る。２番目と５番目に入る語句の番号を答えなさい。

(1) on which　　(2) rested　　(3) rotated
(4) the cups　　(5) the platform　　(6) was

問 5. 下線部《B》の'nail'と最も近い意味になるものを 1 つ選び、その番号を答えなさい。

(1) abandon　　(2) achieve　　(3) commit　　(4) undergo

問 6. 下線部《C》の'languish'と最も近い意味になるものを 1 つ選び、その番号を答えなさい。

(1) decline　　(2) develop　　(3) remain　　(4) revive

問 7. 本文の内容に合致するものを 2 つ選び、その番号を答えなさい。

(1) Babies are very smart because their brain is the world's greatest learning device, which is by nature familiar with the basic way the world works.

(2) To know whether the babies had the concept of object permanence, Jean Piaget observed how they behaved when the toy they had just seen was concealed.

(3) The result of a basic Piaget test indicated that cockatoos had such a good sense of object permanence that some had trouble looking for the hidden food.

(4) The birds could easily follow the right cup in the rotation task as well as in the translocation task only when its position was changed just once.

(5) According to von Bayern, cockatoos have acquired pronounced spatial-rotation abilities in order to fly and hunt for food or escape from enemies.

(6) The ability to hunt for fixed foods in a stationary environment is less important to humans than it is to birds because we live on the ground.

第３問　次の英文の空所 ア～シ に、それぞれ与えられた文字で始まる単語を入れなさい。

The word 'drug' refers to a chemical substance that is taken deliberately in order to obtain some desirable effect. Some drugs are used medically to (ア: t_____) illnesses whereas others are taken because of their pleasurable effects. Both uses are ancient in their origins. (イ: T_____) first humans were hunter-gatherers; they had to learn which of the thousands of plants in their (ウ: e_____) were good to eat and which were poisonous. By trial and error they also gradually accumulated (エ: k_____) of which plants or other natural materials might help to relieve pain or treat the symptoms (オ: o_____) their illnesses. The consumption of medicinal plants is not restricted to humans; studies of chimpanzee behaviour (カ: h_____) revealed that sick animals sometimes select plants not usually contained in their diet for their antiparasitic (キ: e_____).

Before there was a written language, knowledge of plant medicines was handed on by word of (ク: m_____) from one generation to another. This eventually became a specialized occupation for the 'medicine man', 'shaman', (ケ: o_____) 'witch doctor', who often combined medical knowledge with the practice of magic and religious rites and (コ: b_____) a potent and powerful figure in the community. The belief in spirits that could interfere with (サ: l_____) for good or evil, and therefore could cause disease, was almost universal, so it is not (シ: s_____) that knowledge of drugs was combined with this superstitious role.

Leslie Iversen, *Drugs: A Very Short Introduction*, 2001

注　antiparasitic：抗寄生虫の　　religious rites：宗教儀式