令和4年度　入学試験問題

医　学　部　（Ⅰ期）

英　語（必須科目）
数　学・国　語（選択科目）

注　意　事　項

1. 試験時間　令和4年2月4日，**午前9時30分から11時50分まで**
2. 配付した試験問題(冊子)，解答用紙の種類はつぎのとおりです。

⑴　**試験問題**(冊子，左折り)(表紙・下書き用紙付)

英　語
数　学(その1，その2)
国　語(その1，その2)

⑵　**解答用紙**

英　語	1枚(上端黄色)(右肩落し)
数　学(その1)	1枚(上端茶色)(右肩落し)
〃　(その2)	1枚(上端茶色)(左肩落し)
国　語(その1)	1枚(上端紫色)(右肩落し)
〃　(その2)	1枚(上端紫色)(左肩落し)

数学，国語は選択した1科目(受験票に表示されている)が配布されています。

3. 下書きが下書き用紙で足りなかったときは，試験問題(冊子)の余白を使用して下さい。
4. 試験開始2時間以降は退場を許可します。但し，試験終了10分前からの退場は許可しません。
5. 受験中にやむなく途中退室(手洗い等)を望むものは挙手し，監督者の指示に従って下さい。
6. 休憩のための途中退室は認めません。
7. 退場の際は，この試験問題(冊子)を一番上にのせ，挙手し，監督者の許可を得てから，試験問題(冊子)，受験票，下書き用紙および所持品を携行の上，退場して下さい。
8. 試験終了のチャイムが鳴ったら，直ちに筆記をやめ，おもてのまま上から解答用紙〔英語，数学(その1)，数学(その2)，または，国語(その1)，国語(その2)，計3枚〕，試験問題(冊子)の順にそろえて確認して下さい。確認が終っても，指示があるまでは席を立たないで下さい。
9. 試験問題(冊子)と下書き用紙は持ち帰って下さい。
10. 監督者退場後，試験場で昼食をとることは差支えありません。ゴミ入れは場外に設置してあります。
11. 試験会場内では，昼食以外は，常にマスクを着用して下さい。
12. 休憩時間や昼食時等における他者との接触，会話を原則禁止します。
13. 午後の集合は1時です。

英　　語

1 次の各文の(　　　)の中に入れるのに最も適切な表現を1つずつ選び，記号で答えなさい。

1. Shall we go fishing at Lake Kawaguchi this weekend — if you have time, (　　　) is?
   A．it　　B．so　　C．that　　D．this

2. Archie thought that he had only been asleep for five minutes, but it turned out that he had been for (　　　) hours.
   A．as long　　B．as many　　C．so long　　D．so much

3. (　　　) should be on display when we visit the museum next month.
   A．Many a Picassos　　B．Many Picassos
   C．More a Picasso　　D．Much Picasso

4. I am not fully convinced of those arguments as they seem to have been (　　　).
   A．applepicked　　B．cherrypicked　　C．olivepicked　　D．peachpicked

5. (　　　) shops in this area sell second-hand clothes.
   A．Almost　　B．Most　　C．Most of　　D．The most

6. Somewhere in the region (　　　) a city which was destroyed when the Roman Empire fell.
   A．laid　　B．lay　　C．lie　　D．lying

7. After the release of a new version of virus protection software, all computers in the office need (　　　).
   A．be updated　　B．to update　　C．update　　D．updating

8. (　　　) it not been for your help, I would not have passed my driving test.
   A．Had　　B．Have　　C．Was　　D．Would

9. If you (　　　) need any further information, please feel free to contact us.
   A．ever　　B．hitherto　　C．since　　D．so far

10. Jeff said he could get the presentation ready by the end of the day, (　　) was of course unrealistic.

A. so　　B. such　　C. that　　D. which

11. (　　) on a hill, our hotel commands a magnificent view of the city.

A. Been situated　　B. Being situating

C. Situated　　D. Situating

12. I recommend you buy some fresh local (　　) at the market.

A. produce　　B. produced　　C. producers　　D. production

13. Doctors, nurses, paramedics, and (　　) were all called in to help with the emergency.

A. the akin　　B. the alike　　C. the like　　D. the similar

14. I (　　) Mt. Fuji more than two decades ago while I was in my first year of university.

A. had climbed　　B. had been climbing

C. climbed　　D. have climbed

15. There are quite a few problems to be dealt with, and they are fairly complicated ones at (　　).

A. all　　B. last　　C. most　　D. that

2 下記の英文を読み，質問に答えなさい。

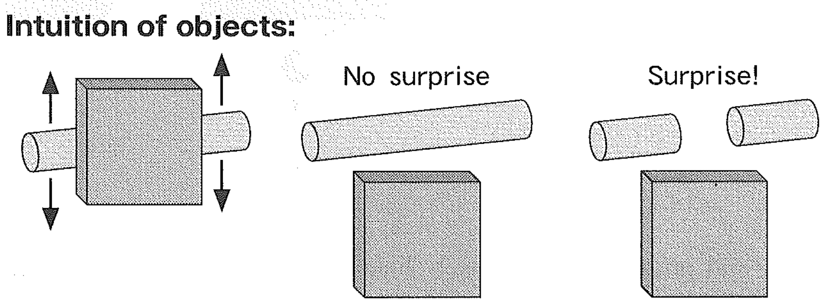
[1] On the surface(i), what could be more destitute of* knowledge than a newborn? What could be more reasonable than to think, as Locke did, that the infant(ii)'s mind is a "blank slate"* simply waiting for the environment to fill its empty pages? Jean-Jacques Rousseau (1712–78) strove to make this point clear in his work *Emile, or On Education* (1762): "We are born capable (ア) learning, but knowing nothing, perceiving nothing."

[2] We now know that this view is dead wrong — (I) could be further from the truth. Appearances can be deceiving: despite its immaturity, the nascent* brain already possesses considerable knowledge inherited (イ) its long evolutionary history. For the most part, however, this knowledge remains invisible, because it does not show in babies' primitive behavior. It therefore took cognitive scientists much ingenuity(iii) and significant methodological advances in order to expose the vast repertoire(iv) of abilities all babies are born (ウ). Objects, numbers, probabilities, faces, language... the scope of babies' prior knowledge is extensive.

[3] We all have the intuition that the world is made of rigid objects. In reality, it is made up of atoms, but at the scale on which we live, these atoms are often packed together into coherent* entities that move as a single blob* and sometimes collide without losing their cohesiveness... These large bundles of atoms are what we call "objects." The existence of objects is a fundamental property of our environment. Is this something that we need to learn? No. Millions of years of evolution seem to have engraved* this knowledge into the very core of our brains. As early as a few months of age, a baby already knows that the world is made up of objects that move coherently, occupy space, do not vanish (エ) reason, and cannot be in two different places at the same time. In a sense, babies' brains already know the laws of physics: they expect the trajectory* of an object to be continuous in space as in time, without any sudden jump or disappearance.

[4] How do we know this? Because babies act surprised in certain experimental situations that violate the laws of physics. In today's cognitive science laboratories, experimenters have become magicians. In small theaters specially designed for babies, they play all sorts of tricks: on the stage, objects appear, disappear, multiply, pass through walls.... Hidden cameras monitor the babies' gazes, and the results are clear-cut: even babies a few weeks old are sensitive (オ) magic. They already possess deep intuitions of the physical world and, like all of us, are (II) when their expectations turn out to be false. By zooming in on the children's eyes — to determine where they look and for how long — cognitive scientists manage to accurately measure their degree of surprise and infer what they expected to see.

[5] Hide an object behind a book, then suddenly crush it flat, (Ⅲ) the hidden object no longer existed (in reality, it escaped through a trapdoor*): babies are extremely surprised! They appear astonished when an object disappears behind one screen and reappears behind another, without ever being seen in the empty space between the two screens. And they expect objects to form a coherent whole: if they see two ends of a stick moving coherently on both sides of a screen, they expect them to belong to a single stick and are shocked when the screen lowers and reveals two distinct rods (see figure 1 below).

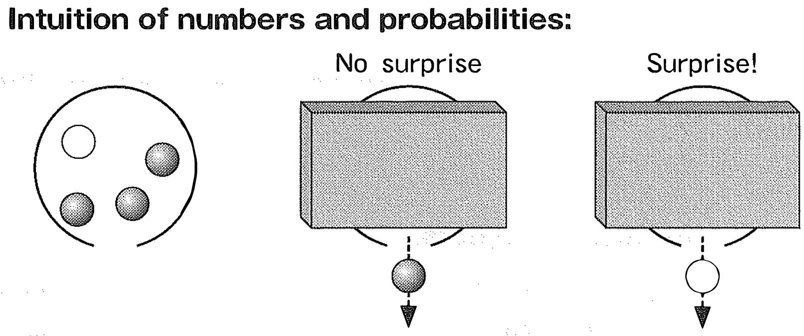


(Figure 1)

[6] Let's take a second example: arithmetic. For instance, can babies calculate? Suppose that children see an object hide behind a screen, followed by a second one. The screen then lowers — lo and behold*, only one object is there! Babies manifest their surprise. If, however, they see the two expected objects, they look at them for only a brief moment. This behavior of "cognitive surprise," in reaction to the (Ⅳ) of a mental calculation, shows that, as early as a few months of age, children understand that 1 + 1 should make 2. Such experiments work not only for 1 + 1 and 2 − 1, but also for 5 + 5 and 10 − 5. Provided that the error is big enough, nine-month-old babies are surprised whenever a concrete display hints (カ) a wrong calculation: they can tell that 5 + 5 cannot be 5, and that 10 − 5 cannot be 10.

[7] Going from numbers to probabilities takes only one step... a step that researchers have recently taken by wondering if babies a few months old could predict the outcome of a lottery draw. In this experiment, babies are first presented with a transparent box containing balls that move around randomly. There are four balls: three black and one white. At the bottom, there is an exit. At some point, the container is occluded*, and then either a black ball or a white ball comes out the bottom. Remarkably, the child's surprise is directly related to the improbability of what she sees: if a black ball comes out — the most likely event, since the majority of the balls in the box are black — the

baby looks at it for only a brief moment... whereas if the more improbable outcome occurs, the baby looks at it for much longer. The duration of her gaze always reflects the improbability of the observed situation, which she seems to compute based on the number of objects involved (see figure 2 below).



(Figure 2)

[8] Logic and probability are closely linked. As Sherlock Holmes put it, "When you have eliminated the impossible, whatever remains, however improbable, must be the truth." In other words, one can turn a probability into a certainty by using reasoning to eliminate some of the possibilities. If a baby can juggle with probabilities, she must also master logic, because logical reasoning is only the restriction of probabilistic reasoning to probabilities 0 and 1. This is exactly what the philosopher and developmental psychologist Luca Bonatti recently showed. In his experiments, a ten-month-old baby first sees two objects, a flower and a dinosaur, hide behind a screen. Then one of these objects exits from the screen, but it is impossible to tell which one because it is partially hidden in a pot, so that only the top can be seen. Later, the dinosaur exits from the other side of the screen, in full sight. At this point, the child can make a logical deduction*: "It is either the flower or the dinosaur that is hiding in the pot. But it cannot be the (①), because I have just seen it come out from the other side. So, it must be the (②)." And it works: the baby is not surprised if the (③) comes out of the pot, but she is if the (④) comes out. Furthermore, the baby's gaze reflects the intensity of her logical reasoning: like an adult, her pupils dilate* at the precise moment when deduction becomes possible. A true Sherlock Holmes in diapers*, (V).

[Adapted from Stanislas Dehaene 2020 *How We Learn – The New Science of Education and the Brain*]

NOTES

destitute of　～が欠けている

blank slate　白紙状態

nascent　発生期の

coherent　まとまりのある

blob　かたまり

engrave　刻む

trajectory　軌道

trapdoor　落とし戸

lo and behold　驚いたことに

occlude　遮蔽する，隠す

deduction　推論

dilate　開く，散大する

diaper　おむつ

1. 下線部(i)から(iv)の単語のなかで第一強勢(第一アクセント)の位置が他と異なるものを１つ選び記号で答えなさい。

2. 空欄(　ア　)から(　カ　)に入る前置詞として最も適切なものを下記の選択肢から選んで記号で答えなさい。但し，同じ語は繰り返し使えないものとします。

(A)　at　　(B)　from　　(C)　of

(D)　to　　(E)　with　　(F)　without

3. 空欄(Ⅰ)から(Ⅴ)に入る表現として最も適切なものを各々の選択肢から1つ選んで記号で答えなさい。

空欄(Ⅰ)

(A) anything
(B) everything
(C) nothing
(D) something

空欄(Ⅱ)

(A) chuffed
(B) delighted
(C) stunned
(D) tormented

空欄(Ⅲ)

(A) as if
(B) even if
(C) even though
(D) only if

空欄(Ⅳ)

(A) accumulation
(B) revelation
(C) stipulation
(D) violation

空欄(Ⅴ)

(A) the subject seems to start with several hypotheses and then tests any of them, thus moving from certainty to probability
(B) the baby seems to start with several hypotheses and then eliminates some of them, thus moving from probability to certainty
(C) the well-known detective seems to start with several hypotheses and then eliminates all of them, thus moving from probability to certainty
(D) the infant seems to start with several hypotheses and then tests some of them, thus moving from certainty to probability

4. Figure 2 で示されている実験について，(a)実験装置と手順，(b)実験結果，(c)実験結果から示唆されることの3点の概要を本文の内容に即して日本語で簡潔にまとめなさい。解答欄に収まる長さにすること。

5. [8]の下線部を日本語に訳しなさい。

6. [8]の空欄①から④には dinosaur または flower のいずれかの単語が入る。dinosaur が入る場合には(A)を，flower が入る場合には(B)を解答欄に書きなさい。

3 下記の英文を読み，質問に答えなさい。但し，[A]を除く他の段落は本来の順番が入れ替わっています。

[A] Imagine yourself as an alien with an exceptionally powerful telescope trying to understand what happens on Earth. You come across a soccer match, but your telescope isn't powerful enough to see the (ア). You can make out a pitch with goals at each end, and players moving about, seemingly with some sort of organisation, but it's hard to understand what is happening precisely. You publish the observation in the *Alien Journal of Earth Science*. A few other aliens email you congratulations, but only a few.

[B] While others might have dismissed the observation without thinking very deeply about it, she wonders if there might be something there which causes the net to bulge* — a ball — but it's just too small to see. At first you don't believe her, but the idea grows on you. With a ball, everything else starts to make sense: the movements of the players, the net, the cheers, the whole game, and in time other aliens agree, there has to be a ball there. Even though nobody can see the ball directly, everyone agrees it's there <u>(so/things/is/make/it/because/sense/many/if)</u>. You, your colleague and the alien who invented the super-powerful telescope collect many prizes, and everyone wants to be your friend.

[C] This tale of aliens and sport reflects how many discoveries are made. Take, for example, the discovery of the planet Neptune*, first seen in 1846. The movement of another planet, Uranus*, had been carefully tracked, and mathematical calculations showed that it didn't quite follow a simple orbit around the sun. This could be explained if an unseen planet was pulling on Uranus to influence its path. British and French astronomers calculated where such a planet would have to be located if it were to account for the distortion* in the movement of Uranus. Then, with a telescope pointed precisely at the predicted place, the new planet was seen — Neptune. Today, a substance called dark matter and a force called dark energy are predicted to exist in order to explain the movement of stars and galaxies. As yet, both remain (イ).

[D] Alien telescopes might improve again so that the ball is eventually seen. But equally, this might not happen. A heavy weight of evidence suggests the ball is there, but there may be no direct proof. At some level, it's debatable whether anything can ever be proven absolutely: there is no way of proving the sun will rise again tomorrow, just a heavy weight of evidence that says it will.

[E] In time, alien telescopes improve, and then occasionally you see one of the players in front of one of the goals fall over. Sometimes this is followed by the crowds of people around the pitch waving and cheering. It still doesn't make much sense, but leads to discussion at the bar during the Alien Congress of Earth Science. Eventually, when you are much older, a younger alien working with you notices something especially intriguing. When the player in front of the goal falls over, whether or not the crowd cheers seem to depend on one thing: whether or not the net bulges outwards. This leads your younger colleague to have a brilliant idea.

[Adapted from Daniel M. Davis (2021) The Secret Body — How the New Science of the Human Body Is Changing the Way We Live.]

NOTES

bulge　膨らむ

Neptune　海王星

Uranus　天王星

distortion　歪み

1. [B]から[E]の4つの段落を正しい順番に並べ替えなさい。

2. (　ア　)と(　イ　)の空欄に単語を1つずつ補いなさい。但し，本文中にある単語をそのまま形を変えずに使うこと。

3. [B]の下線部の(　　　)内の単語を並べ替えて，正しい英文を完成させなさい。但し，2番目にはsoが入るものとし，解答用紙には1番目，6番目，9番目に入る単語を書きなさい。

< ① > < so > < 　 > < 　 > < 　 > < ⑥ > < 　 >
< 　 > < ⑨ >

4. [E]には文法上誤りのある単語が1語含まれている。その語をそのまま書き抜きなさい。

5. 本文の要旨を100字以内の日本語でまとめなさい。但し，句読点も字数に含むものとする。