

平成22年度 入学試験問題

医学部 (Ⅱ期)

英語・数学

注意事項

1. 試験時間 平成22年3月6日、午前9時30分から12時まで。
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。
 - (1) 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)
 - (2) 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)
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時間以後からは退場を許可します。但し、試験終了10分前以降の退場は許可しません。
5. 受験中にやむなく外出(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. 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)、受験票および所持品携行の上退場して下さい。
7. 休憩のための退場は認めません。
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試験問題(冊子)、解答用紙[英語、数学(その1)、数学(その2)]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)はお持ち帰り下さい。
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. 午後の集合は1時15分です。

英語 訂正

訂正 1

問題冊子 2 ページ

1

長文下 (注)

誤 正

variants 異変形 → 変異形

訂正 2

問題冊子 4 ページ

3 3

誤 正

C. having been lived → C. Having been lived

訂正 3

問題冊子 5 ページ

5 4

誤 正

B: Oh yes, you (). → B: Oh no, you ().

英 語

1 次の文章を読んで、後の設問に答えなさい。

Margaret Thatcher famously got by on four hours a night as Prime Minister, while George W. Bush wanted at least eight. The differing need for sleep extends even to those with countries to run.

Scientists may now be able to explain why: new research suggests that some of us are genetically programmed to spend longer in the Land of Nod* than others.

Researchers have for the first time identified a genetic mutation linked to the amount of sleep people need. Those who carry the mutation sleep on average two hours less a night — but still function perfectly well. While the mutation is probably rare, it offers the strongest evidence yet of the role genes play (a) our need for sleep. Even if Lady Thatcher does not have this particular mutation, it is likely that aspects of her DNA allowed her to cope with so little rest.

The findings, from a team at the University of California, San Francisco, also offer insight into the biology of human sleep needs. (ア) a lack of sleep is generally linked to slower brain activity and poor physical and psychological health, people with the short-sleep mutation suffer none of these ill-effects and are active, vigorous* and healthy. Scientists hope that (b) understanding the biology involved, they may eventually be able to develop drugs that help people stay awake for longer without damaging their health.

Ying-Hui Fu, who led the research, said: “The majority of people need eight to eight and a half hours of sleep, and though they can try to drink coffee to sleep less, it isn’t their natural state. (イ) we can understand this biological pathway, perhaps we can come up with a therapeutic compound. Maybe we can help people sleep less in a safe way.”⁽¹⁾

Scientists have long thought it likely that human sleep patterns are linked to genetics, and a tendency to sleep for longer or shorter periods often runs in families. Several genes have already been identified that affect whether people are likely to be up with the lark* or a night owl.

No gene had previously been found to affect how long people sleep, though several are known from animal studies. In the new research, published in the journal *Science*, Dr. Fu’s team studied a family in which the mother and daughter require significantly less sleep than close relatives. The two sleep an average of six hours, 15 minutes each night, compared with eight hours, four minutes for other family members — but suffer no ill-effects.

Dr. Fu said, “They are very healthy and extremely active. One of them is over 70, and is perfectly healthy and travels all over the world.” The team then looked at several genes

previously associated with sleep patterns in mice. One, called DEC2, was found to be mutated in the two short-sleepers, but not in the rest of the immediate family.

The researchers then created genetically-modified mice carrying the same mutation. "The mice with the mutation slept on average two and a half hours less than normal mice," said Dr. Fu. The mutant mice remained just as active as normal mice. Dr. Fu said that although mutations in the DEC2 gene are almost certainly extremely rare, many other genetic variations are also likely to affect people's need for sleep. "There will be common variants* that are involved," she said.

In a commentary on the research for *Science*, Hyum Hor and Mehdi Tafti, of the University of Lausanne in Switzerland, said: "Sufficient sleep is necessary for optimal daytime performance and wellbeing, (ウ) there is a large difference in how much sleep people need, ranging from less than six to more than nine hours.

"People at all points along this range exhibit no noticeable differences in health and waking performance. Those of us who envy short sleepers would like to reduce sleep duration to the minimum necessary for normal functioning, but do we know what the minimum is?"

"Short sleepers are found in families, as are long sleepers, which suggests a genetic basis for sleep duration." They said the research added new evidence by showing that a mutation in DEC2 was associated with short sleep in humans and mice.

"The question 'how much sleep do we need?' is not only (c) practical interest for obvious societal reasons, but is also of major importance for understanding sleep function."

"Genetic mutation may be why some people need less sleep than others," by Mark Henderson, *The Times*, August 14, 2009.

(注) the Land of Nod 眠り vigorous 活発な be up with the lark 早起きする
variants 異変形

1. 本文中の(ア)~(ウ)に入れるのに最も適切な表現を1つ選び記号で答えなさい。なお、文頭に来る単語も小文字で始めています。
A. furthermore B. while C. if D. before
E. yet F. after G. because
2. 下線部(1)に最も近い意味を持つ語(句)を1つ選び記号で答えなさい。
A. raise up B. think of C. alter D. refuse E. go out
3. 下線部(2)の表す具体的内容を20字以内の日本語で説明しなさい。

4. 本文中の(a)～(c)に入れるのに最も適切な前置詞を1つずつ選び記号で答えなさい。

- A. of B. in C. with D. by
E. to F. at G. after

5. 本文の内容を正しく説明しているものにはTを, 誤って説明しているものにはFを書きなさい。

- A. New research suggests that the human body is genetically programmed to sleep at least eight hours a day.
B. A team at the University of California found the drugs that can help people stay awake for longer without damaging their health.
C. It has long been thought that human sleep patterns and genetics may somehow be related.
D. The gene that affects people's need for sleep is only DEC 2.
E. In order to understand sleep function, we have to know how much sleep we need.
F. The research led by Dr. Fu found that genetically-modified mice with the mutation in the DEC 2 gene slept on average two and a half hours less than normal mice but they were still active.
G. According to this article, people who sleep from less than six to more than nine hours exhibit no noticeable differences in health and waking performance.
H. According to this article, people in the same family always show similar sleeping patterns.

2 下線部の発音が他と違うものを1つ選び, 記号で答えなさい。

1. A. jacket B. exact C. arise D. climax E. application
2. A. insult B. urban C. utter D. understand E. sun
3. A. against B. magnet C. begin D. magic E. kangaroo
4. A. ready B. pleasure C. thread D. cease E. breath
5. A. lose B. preserve C. phrase D. base E. possess

3 ()の中に入れるのに最も適切な表現を1つ選び記号で書きなさい。

1. Can you make () in Italian?
A. understood B. yourself understood C. yourself understand
D. yourself understanding E. yourself to understand
2. I suppose it didn't () to you to call your neighbours.
A. seem B. happen C. allow D. occur E. make

3. () in Japan for many years, my sister loves the people and nature here.
 A. Living B. Having lived C. having been lived
 D. Being lived E. Lived
4. () I call, my boss is out.
 A. All day B. Every minutes C. Everyone
 D. Every time E. Each hour
5. If there had been another storm, our village () ruined.
 A. would be B. would have been C. would have had
 D. was E. may be
6. It wasn't long () my father recovered from his illness.
 A. when B. how C. before D. enough E. where
7. This proposal is still () consideration.
 A. on B. with C. above D. in E. under
8. We should keep this matter () the two of us.
 A. among B. against C. around D. between E. with
9. I see no () why he should not excuse her for her mistakes.
 A. help B. wonder C. reason D. difficulty E. way
10. I () in front of the department store.
 A. had my bicycle steal B. had my bicycle robbed
 C. had my bicycle stolen D. was my bicycle robbed
 E. was my bicycle stolen

4 次の各和文の意味に合うように[]内の語(句)を並べ替えて英文を完成させなさい。ただし、足りない単語が一つあるので、それは自分で補いなさい。また解答欄には[]内だけを書くこと。なお、文頭に来る単語も小文字で始めています。

- あなたが兄の助言を受け入れる必要はない。
 [is / there/ take / no / for / to / your /you] brother's advice.
- 父がいつも周りにいることを私は当然のように思っていた。
 [took / my father / that/ I / would/ for / always/ granted] be around.
- 私が家に着くとすぐに電話が鳴った。
 I [had / the phone / got / hardly / home] rang.
- コンピュータが直っているかどうかは分からない。
 It [seen /be /computer /to /the /is /or /whether /fixed /remains].

5 次の各英文の()の中に入れるのに最も適切なものを一つずつ選び記号で答えなさい。

1. A : How much do you need?

B : 100 pounds will ().

- a. be b. have c. do d. get e. go

2. A : May I see your identification card?

B : ().

- a. I'm not sure b. I'm afraid not c. I'm very glad
d. I'm on it e. I'm not involved

3. A : I wonder if it is possible to see Mr. Brown now.

B : I'm sorry, sir, but he is () at the moment.

- a. not behind b. not around c. not away
d. not out e. not clear

4. A : Nowadays young people do not know how to behave in the public places.

B : Oh yes, you ().

- a. can say that again b. can't say it's true c. can see that again
d. can hear from them e. can't see it is true

5. A : I'm thinking of quitting my job.

B : Are you serious? What's wrong?

A : ()! You know how much I love my job!

- a. I am b. Just kidding c. Just fine
d. Absolutely e. Probably not

6 次の会話を読んで下線部(1)~(5)に入る文を下の選択肢から一つずつ選び記号で答えなさい。ただし、同じ選択肢を二度選ばないこと。なお、文頭に来る単語も小文字で始めています。

Michael : What's the best way to get from university to the airport? I'm flying down to visit my grandfather in London tomorrow but I don't want to miss the lecture so I'll have to go directly to the airport when it finishes.

Tracey : _____ (1) _____

Michael : It leaves at 6 pm.

Tracey : Don't you have to be at the airport two hours before that to check in?

Michael : _____ (2) _____ I'm travelling within the UK so I have to be there only 30 minutes early.

Tracey : Of course. In that case, _____ (3) _____ You can take a bus right outside the college. It should be quicker than the train.

Michael : But _____ (4) _____ I don't want to risk getting caught up in congestion.

Tracey : Take the train then; _____ (5) _____ Take the subway over to central station and then hop on the airport express. It shouldn't take more than 60 minutes in total.

Michael : That means I'll be there by 4 pm. I suppose I'll be able to be in the airport on time.

Thanks anyway.

<選択肢>

- A. you will have to be in a hurry.
- B. what time does your flight leave?
- C. you will still make it.
- D. you may not like it.
- E. that's only for international flight.
- F. neither is domestic flight.
- G. when will the lecture start?
- H. the traffic could be a problem.
- I. you will have plenty of time.
- J. that sounds perfect.