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試験開始の合図があるまで、この問題冊子の中を見てはいけません。

## 2014年度 第 3 回 全統マーク模試問題

# 外国語〔英語(筆記)〕 (200点 80分)

2014年10月実施

### 注 意 事 項

- 1 解答用紙に、正しく記入・マークされていない場合は、採点できないことがあります。
- 2 この問題冊子は、34 ページあります。

試験中に問題冊子の印刷不鮮明、ページの落丁・乱丁及び解答用紙の汚れ等に気付いた場合は、手を高く挙げて監督者に知らせなさい。

- 3 解答は、解答用紙の解答欄にマークしなさい。例えば、

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 と表示のある問いに対して③と解答する場合は、次の(例)のように解答番号 10 の解答欄の③にマークしなさい。

(例)

解答番号	解 答 欄
10	① ② ● ④ ⑤ ⑥ ⑦ ⑧ ⑨

- 4 問題冊子の余白等は適宜利用してよいが、どのページも切り離してはいけません。

問題を解く際には、「問題」冊子にも必ず自分の解答を記録し、試験終了後に配付される「学習の手引き」にそって自己採点し、再確認しなさい。

# 河合塾







# 英 語 (筆記)

( 解答番号  ~  )

## 第 1 問 次の問い(A・B)に答えよ。(配点 14)

A 次の問い(問 1 ~ 3)において、下線部の発音がほかの三つと異なるものを、それぞれ下の①~④のうちから一つずつ選べ。

問 1

① abroad

② boat

③ coat

④ float

問 2

① scene

② science

③ scissors

④ scold

問 3

① baked

② checked

③ naked

④ packed

**B** 次の問い(問1～4)において、第一アクセント(第一強勢)の位置がほかの三つと異なるものを、それぞれ下の①～④のうちから一つずつ選べ。

問1 

4
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- ① confess      ② legend      ③ occur      ④ success

問2 

5
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- ① appointment    ② circumstance    ③ newspaper    ④ restaurant

問3 

6
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- ① barometer                      ② comprehension  
③ influential                      ④ unemployment

問4 

7
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- ① appreciate    ② cooperate    ③ investigate    ④ manufacture

**第2問** 次の問い(A～C)に答えよ。(配点 44)

A 次の問い(問1～10)の  ～  に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。ただし、 ～  については、( A )と( B )に入れるのに最も適当な組合せを選べ。

問1 You look exhausted! A week in the countryside will  you good.

- ① do                      ② have                      ③ make                      ④ take

問2 Now that our son is independent of us, my wife and I enjoy life to the full. We're eating out more often than we .

- ① used                      ② used to                      ③ were used                      ④ were used to

問3 Tom was educated at the local high school, after  he went on to Harvard.

- ① that                      ② what                      ③ where                      ④ which

問4 The cells of the body, especially  of the brain, can live only minutes without circulating blood.

- ① that                      ② these                      ③ this                      ④ those

問5 Ms. White is in hospital, so  the time being, her classes will be taught by other teachers.

- ① at                      ② for                      ③ in                      ④ on

問6 He was seen 13 the building about the time the crime was committed.

- ① enter                      ② enter into                      ③ entered into                      ④ to enter

問7 It 14 exactly five years since her father died, but she hasn't got over the shock of his death.

- ① has been                      ② has passed                      ③ passed                      ④ was

問8 I waited for Kate yesterday, but ( A ) my disappointment she did not show ( B ). 15

- ① A : at      B : off                                      ② A : at      B : up  
③ A : to      B : off                                      ④ A : to      B : up

問9 There is ( A ) use you asking me any ( B ) questions about that because I won't answer. 16

- ① A : no      B : more                                      ② A : no      B : most  
③ A : not      B : more                                      ④ A : not      B : most

問10 Because there ( A ) heavy traffic on this street, a lot of people are ( B ) in car accidents every year. 17

- ① A : are      B : injured                                      ② A : are      B : injuring  
③ A : is      B : injured                                      ④ A : is      B : injuring

B 次の問い(問1～3)の会話の 18 ～ 20 に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。

問1 Yui: Your boyfriend studied engineering in college, didn't he? These days I often see him at the fishing port. Is he a fisherman?

Rena: No! In fact, he doesn't like fishing.

Yui: Oh, now I'm even more confused!

Rena: He has been diving to do survey work for a bridge his firm is planning to build over the fishing port.

Yui: 18 No wonder I see him by the port.

- ① He is my type.
- ② He should quit it.
- ③ I have no idea.
- ④ That explains it.

問2 Amanda: What will you do after you graduate from high school?

Aki: Well, can you promise not to tell anyone?

Amanda: Of course! You can trust me.

Aki: I want to go to Tokyo and become a member of AMY 47.

Amanda: 19 I thought you'd find a job around here and go surfing every weekend. You love surfing.

Aki: I'm serious! It has always been my dream to become a professional singer and make a lot of people happy.

- ① I'd like to be a star like you someday!
- ② I'm not surprised at all.
- ③ You mean a lot to me!
- ④ You're joking, aren't you?



問 3     Albert: It's better to take a bus to go to the stadium. It takes too long on foot.

Makoto: Really? What's the bus price, then?

Albert: That sounds funny! 

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 In this case, you should say, "bus fare."

Makoto: What's the meaning of "fare?"

Albert: A "bus fare" is the amount of money charged for a journey by bus, and "bus price" would be how much money it would cost to buy a bus.

Makoto: Oh, it seems I have to learn more English words.

- ① Do you want to buy a bus?
- ② It's reasonable, not too high.
- ③ Tickets will be sold out by the time you get there.
- ④ You can buy a ticket over there.

C 次の問い(問1～3)において、それぞれ下の①～⑥の語句を並べかえて空所を補い、最も適当な文を完成させよ。解答は 21 ～ 26 に入れるものの番号のみを答えよ。

問1

Derek: How was your job interview? Do you think they liked you?

Ichiro: I don't know, but they said the candidates' experience and qualifications 21 22 they make a decision.

- |         |                 |         |
|---------|-----------------|---------|
| ① be    | ② consideration | ③ into  |
| ④ taken | ⑤ when          | ⑥ would |

問2

Ann: Hi, Maki. Is there anything special going on at school on September 1?

Maki: Yes. A disaster expert is going to come and explain 23 24 there's a big earthquake.

- |           |             |        |
|-----------|-------------|--------|
| ① in case | ② should do | ③ to   |
| ④ us      | ⑤ we        | ⑥ what |

問3

Alex: Are you getting along well with your new boss?

Shinji: Yes. He trusts me 25 26.

- |        |             |            |
|--------|-------------|------------|
| ① and  | ② decisions | ③ I        |
| ④ make | ⑤ supports  | ⑥ whatever |

(下 書 き 用 紙)

英語(筆記)の試験問題は次に続く。

第3問 次の問い(A～C)に答えよ。(配点 41)

A 次の問い(問1・問2)において、下線部の語句の意味を推測し、27・28に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。

問1

Rob: Congratulations, Sara! I hear you've finally completed your research.

Sara: Thank you so much. I feel relieved at last. It was a really arduous task.

Rob: As a scientist like you, I know how much effort you made. A scientist's work is monotonous, but it's worth it.

Sara: Yes, it is, Rob. Well, I hope what I've done will help more and more people to live more comfortable lives.

Rob: How about going out for a meal to celebrate? Let me treat you.

Sara: Sounds great!

In this situation, 'arduous' means '27'.

- ① dangerous and tough
- ② easy and valuable
- ③ impossible and hopeless
- ④ laborious and tiring

問 2

Peter: How come you were scolded by Mr. Smith in class today?

Jack: You won't believe it! Rose, the prettiest girl in our class, asked me to go to the movies with her this weekend!

Peter: Wow, I can't believe it! But what does that have to do with it?

Jack: Well, that surprised and pleased me so much that I couldn't concentrate at all in class. Then, with my head in the clouds, I heard Mr. Smith shouting angrily at me.

In this situation, with my head in the clouds means 

28
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- ① not knowing what was happening around me
- ② not believing my ill luck
- ③ turning my attention to class
- ④ able to answer the question

**B** 次の問い(問1～3)のパラグラフ(段落)には、まとまりをよくするために取り除いた方がよい文が一つある。取り除く文として最も適当なものを、それぞれ下線部①～④のうちから一つずつ選べ。

問1 

29
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One third of all adults worldwide are now overweight or obese. ①But in 2008, more people were overweight or obese in developing countries than in richer countries. ②The developing world's dramatic weight gain is due primarily to two factors: richer diets and lack of exercise. ③Obesity rates in the developed countries increased by 1.7 times. ④More people in poorer countries are earning enough to move from diets built on cereals to diets rich in meat, fat and sugar, and now have increasingly stationary lives. That's leading to rising global incidence of diseases like cancer, diabetes, heart disease and stroke.

問2 

30
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Most experts think that flu viruses are spread mainly by droplets released when people with the flu cough, sneeze or talk. ①These droplets can land in the mouths or noses of people who are nearby or possibly be taken into the lungs. ②Less often, a person might also get the flu by touching a surface or object that has the flu virus on it and then touching their own mouth or nose. ③Such minor symptoms are normal and should be expected as the body builds immunity. ④To reduce infection, people should stay away from sick people and stay home if they are sick. It also is important for people to wash their hands often with soap and water.

Car sickness is essentially the same as sea sickness or air sickness — it all comes under the banner of motion sickness. ①Basically your brain is receiving conflicting signals from your eyes and ears. ②However, your eyes and ears work simultaneously. If you are looking at the floor or a book when in a car or on a bus, your eyes are telling you that you are not moving. ③But your ear is telling your brain that you are indeed moving. So your body, instead of realizing you are reading a book on a bus, thinks it is being poisoned, and the only way to deal with poison is to vomit it all up. ④One way of getting around this is to look out of the window into the distance. This will mean that the signals from your eyes and ears match.

- C 次の会話は、シカの害に苦しんでいるアメリカのある町での専門家を招いた会議の一場面である。 32 ~ 34 に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。

Moderator: Our town has a deer problem. We are thinking of launching a project to kill deer in order to reduce deer overpopulation, protect trees, shrubs, and gardens, and prevent deer and car collisions. Today we have invited three experts on deer population management and asked them to give us some advice. First, Mr. Ted Smith, what do you think about our project?

Ted: Deer are highly fertile, and their high reproductive rate can quickly compensate for declines in their population. When deer numbers are reduced after a killing program, the remaining female deer will often respond to greater food abundance by giving birth to twins or triplets. These young deer also have higher survival rates and reach sexual maturity earlier. The end result is a quick “rebound” in numbers.

Moderator: So, Ted, I guess you’re saying that 32 .

- ① male deer rather than female deer should be wiped out
- ② more young deer will be left alone, which is extremely bad
- ③ the project will not necessarily have the desired effect
- ④ the project will result in keeping deer numbers down

Moderator: Next, Mr. David Johnson, how about you?

David: Killing deer will not resolve people’s conflicts with deer in their gardens. Certain plants like tulips and roses are irresistible to deer. Even if the deer population could be brought to a very low level, these top-choice flowers would still be eaten by any remaining deer. That’s why an effective solution should focus on keeping deer away and protecting flowers rather than trying to shoot every



deer that may come along and eat them.

Moderator: So, David, your idea is that residents should 33.

- ① kill as many deer as possible
- ② not plant flowers in their gardens
- ③ not prevent deer from invading their gardens
- ④ stop deer from coming into their gardens

Moderator: Now, Mr. Leslie Brown, tell us your honest opinion.

Leslie: Studies have shown that reducing the deer population does not necessarily reduce the number of collisions between cars and deer. In some cases, collision numbers are actually lower in areas with more deer. Many factors, such as traffic volume, speed limits, and the use of visual barriers, help to reduce deer-vehicle collisions. This is why reducing the number of deer alone does not work to reduce vehicle collisions with deer.

Moderator: So, Leslie, you mean that 34.

- ① it is not humans that are responsible for deer/auto collisions
- ② killing deer doesn't always help to reduce vehicle collisions with deer
- ③ the frequency of deer/auto collisions depends on the number of deer
- ④ the key to solving this problem is to drive as little as possible

Moderator: Hmm, it looks as though we will have to abandon our project and come up with a better idea. We'll have to develop a comprehensive plan, based on these suggestions, that does not involve killing deer.

#### 第4問 次の問い(A・B)に答えよ。(配点 35)

- A 次の文章はある報告書の一部である。この文章とグラフを読み、下の問い(問1～4)の 35 ～ 38 に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。

##### Women in STEM: A Gender Gap to Innovation

Our science, technology, engineering and math (STEM) workforce is crucial to America's innovative competitiveness. Yet there are not enough women in STEM jobs or among STEM degree holders despite the fact that they make up nearly half of the US workforce and half of the college-educated workforce.

Although women fill close to half of all jobs in the US economy, they hold less than 25 percent of STEM jobs. This has been the case throughout the past decade, even as college-educated women have increased their share of the overall workforce. Women with STEM jobs earned 33 percent more than comparable women in non-STEM jobs — considerably higher than the STEM premium for men. As a result, the gender wage gap is smaller in STEM jobs than in non-STEM jobs.

Among STEM majors, the distribution of men and women differs significantly. As shown in the figure below, well over half of female STEM majors study physical and life sciences, while fewer than one-third of men choose these fields. The proportion choosing math majors is also higher than in men: 10 versus 5%. The bulk of men with STEM majors choose engineering degrees, two-and-a-half times the proportion of women who choose engineering. Equal proportions of male and female STEM majors enter computer science. In terms of raw numbers, however, men in the workforce with STEM degrees outnumber women across all four fields of study.

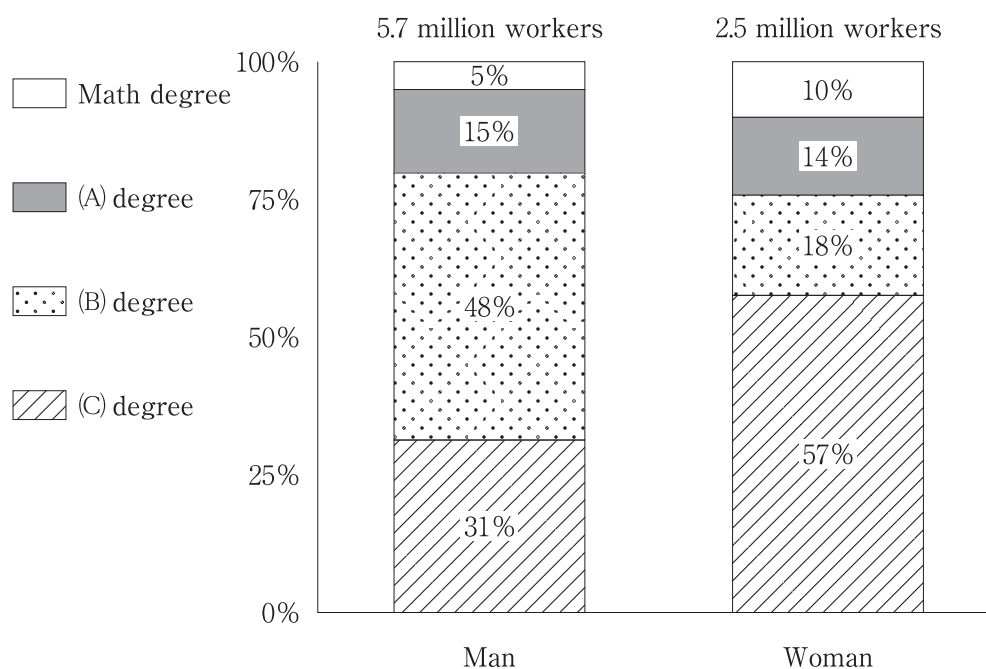
Even when women choose STEM degrees, their typical career paths separate substantially from their male counterparts. About 40 percent of men with STEM degrees work in STEM jobs, whereas only 25 percent of women

with STEM degrees work in STEM jobs. Men are more likely to have non-STEM management jobs than women. In contrast, female STEM majors are twice as likely as men to work in education or healthcare.

There are many possible factors contributing to the difference between women and men in STEM jobs. For example, STEM career paths may be less helpful to people cycling in and out of the workforce to raise a family. The lack of female STEM role models and strong gender stereotypes against women in STEM fields may discourage women from pursuing STEM education and STEM jobs.

## Figure

**Proportions of male and female workers holding different STEM degrees, 2009.**



Source: US Department of Commerce, Economics and Statistics Administration

問 1 According to the passage, what can we say about women in STEM jobs?

35

- ① Most of them aren't satisfied with their present jobs.
- ② Their number has been decreasing gradually.
- ③ Their share of STEM jobs has been low for ten years.
- ④ They earn less than women in non-STEM jobs.

問 2 Which of the following combinations represents the three fields of study (A), (B), and (C) in Figure? 36

- ① (A) Computer science (B) Engineering  
(C) Physical and life sciences
- ② (A) Computer science (B) Physical and life sciences  
(C) Engineering
- ③ (A) Engineering (B) Physical and life sciences  
(C) Computer science
- ④ (A) Physical and life sciences (B) Engineering  
(C) Computer science

問 3 The reason for the gender gap in STEM jobs might be that 37.

- ① it is easy for girls to find experienced females in STEM to follow and admire
- ② married women have difficulty balancing their STEM jobs with child care
- ③ people believe that science and math are women's fields, not men's
- ④ women in STEM don't like standing out among their office colleagues

問 4 The main purpose of this passage is to 

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- ① describe how important higher education levels are to women in STEM
- ② describe the present situation with regard to women in STEM and its causes
- ③ explain how women in STEM have bridged the gap between men and women
- ④ report how to support women in STEM in communities

B 次のページのペット保険の広告を読み、次の問い(問1～3)の 39 ～ 41 に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。

問1 Which of the following is **NOT** true concerning insurance coverage?

39

- ① If there is something wrong with your dog, the telephone helpline will be free.
- ② If your cat needs nutrition supplement food, the cost will be covered.
- ③ If your cat scratches someone's new car, the repair cost will be covered.
- ④ If your dog barks too often, the cost of obedience training will be covered.

問2 If you take out a new *Plus policy* on line, what will the total of your insurance payments be during the first year? 40

- ① ￥14,400
- ② ￥21,600
- ③ ￥24,000
- ④ ￥30,000

問3 According to the advertisement, which of the following is true? 41

- ① High-quality pet food will be sent to pet owners who sign up in 2014.
- ② Pet owners have to have their pets examined by a vet before getting the insurance.
- ③ The limit for medical treatment fees is the same under any contract.
- ④ You can buy any of the insurance plans even if your pet dog is old.

**Pet Insurance with long-term coverage as standard from ¥ 1,200 a month.**

♡♡ With Lovely Pet Insurance you won't have to worry about the vet's fees should your pet develop a serious illness. For example, if your dog or cat gets a joint disease the vet's fees are paid until your chosen limit has been reached each and every year, as long as your insurance payments are up to date and your policy is renewed. ♡♡

☆**24-hour help and advice** — You can call a team of experts day or night for advice on anything from grooming to health problems.

☆**Complementary Treatment** — Covers any alternative treatments recommended by your vet such as massage and treatment for behavioral problems.

☆**No upper age limit for the vet's fees** — It doesn't matter how old your pet is.

☆**Special Food** — Up to ¥ 35,000 towards the cost of the food if your vet recommends a special diet in order to treat a health condition.

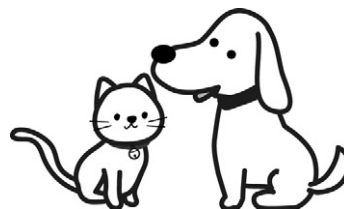
☆**Three levels of coverage** — Get the right coverage for you and your pet

Level	Essential	Plus	Premier
Monthly insurance payment	¥ 1,200	¥ 2,000	¥ 2,500
Vet's fees limit per year	¥ 300,000	¥ 700,000	¥ 1,000,000
Special Food limit per year	¥ 35,000	¥ 35,000	¥ 35,000
Emergency helpline	✓	✓	✓
Complementary Treatment limit per year	¥ 60,000	¥ 120,000	¥ 180,000

We'll send you **¥ 3,000 worth of coupons** to spend on Fresh Market Own Label pet food when you sign up before December 31, 2014.

**10%  
OFF**

Receive 10% off when you buy online!  
(first year's payments only)



lovelypet.com/insurance  
0800-316-4574

**第5問** 日本で暮らすアメリカ人の Elizabeth は、友人の Hitomi の誘いで Mr. Tanaka の茶室でのお茶会に出席した。次の文章は、Hitomi の英文日記と、Elizabeth が後日 Mr. Tanaka に宛てたお礼の手紙である。文章を読み、下の問い(問1～5)の 

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 に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。(配点 30)

Hitomi's Diary

January 24, 2014

Today I really enjoyed the tea ceremony Mr. Tanaka invited us to at his teahouse. I used to study the tea ceremony with Mr. Tanaka as a student in the same class. But since my mother died a year ago, I have not felt like doing anything. So I stopped attending the class and had not seen him for a long time. He sometimes asked me to visit his house and attend the tea ceremony in his teahouse, but I declined the invitations. He and his wife were so worried about me that they didn't give up asking me to come. I appreciated that and finally I decided to participate in the tea ceremony. I remembered that one of my friends, Elizabeth, had said she really wanted to experience the tea ceremony, so I asked Mr. Tanaka to invite her. He had also invited Yoko, who was a student in our tea ceremony class. It was a little stressful, though, because Yoko was just a beginner and Elizabeth doesn't know much about the tea ceremony. I tried to show them how to do things correctly, so they would not feel embarrassed. Although I decided to wear a kimono, they did not.

At 10:30 a.m., we entered Mr. Tanaka's teahouse. It was peaceful and quiet, and all of Mr. Tanaka's preparations made me feel calm. There was an old scroll hanging in the alcove with a beautiful brush painting that especially impressed me. Before long, Mr. Tanaka entered the room and began to perform the tea ceremony. First, he started a fire with some charcoal and we observed how he was doing it. Elizabeth said she had never seen that. Next, Mr. Tanaka made tea for us and we tasted it. After that, we moved to another



room and simple Japanese meals were served for lunch. Every dish was so delicious. Again, we entered the teahouse and I noticed some of the decorations in the room had been changed. The hanging scroll had been moved away and there was a white flower instead in the alcove. I felt this traditional Japanese hospitality was wonderful. In the silence, the sound of the water boiling reminded me of the time when I enjoyed the tea ceremony in the class with Mr. Tanaka.

Today's tea ceremony made me think that I would like to start taking the tea ceremony lessons again. Elizabeth and Yoko seemed to have had a very good time. Elizabeth seemed especially excited at all the things she had experienced for the first time. I feel really grateful to Mr. Tanaka and his wife for this wonderful day.

### **A letter to Mr. Tanaka**

January 25, 2014

Dear Mr. Tanaka,

Thank you very much for inviting me to your fascinating tea ceremony. Though I studied the tea ceremony a little in the US, it was the first time I had taken part in the tea ceremony in Japan, so actually I was a little nervous at first. But thanks to your wonderful hospitality, I felt very much at home.

I was really impressed with the various preparations you made beforehand. When I came through the gate, I noticed water had been sprinkled on the walkway. I've heard it is called *uchi-mizu* in Japanese. When I washed my hands in the stone washbowl in the garden, I was surprised that it was filled with warm water. During the tea ceremony, the change in the way the alcove was decorated was very moving, too. It was heart-warming to see the way you had prepared very precious tea-bowls and other things for us which matched the

season. I again felt that Japanese people care a lot about the seasons and I really like this aspect of the culture.

The most surprising thing was how small the entrance to the teahouse was. I had to bow my head very low to enter the room. You told me that it is a reminder of an earlier time when *samurai* enjoyed the tea ceremony. The top of the door is very low to remind them to show humility and the door is very narrow to prevent them from wearing their swords inside, because the tea room was a place for peaceful meetings.

I was also surprised to see you perform the ceremony. I mean I had thought only women enjoy the tea ceremony because in the US there were no men at all in my tea ceremony class. But I have learned that originally it was men who performed the tea ceremony and that some Japanese men still do. The way you performed the tea ceremony was very elegant and different in some ways from the way women perform it, a difference which I found especially interesting.

Also, thank you for lending me the small chair. I cannot kneel formally for a long time, so it helped me a lot. I didn't know there were chairs like that. And I'm sorry I didn't wear a *kimono*. Hitomi looked so beautiful in hers that I would like to try to wear one next time.

Thank you so much again for everything. Please take care of yourself. I am looking forward to seeing you soon.

Sincerely,  
Elizabeth

問 1 Hitomi turned down invitations to the tea ceremony several times because she 

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- ① felt depressed after her mother's death
- ② had no experience of the tea ceremony
- ③ was not a friend of Mr. Tanaka's
- ④ was too worried about her friends

問 2 

43
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 was what struck Hitomi most.

- ① Mrs. Tanaka's warm hospitality toward them
- ② That her friends knew the etiquette for the tea ceremony
- ③ The old hanging scroll with a beautiful picture on it
- ④ The sophisticated architecture of Mr. Tanaka's teahouse

問 3 Which is **NOT** mentioned in Elizabeth's letter? 

44
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- ① The change to the decorations in the teahouse.
- ② The sound of water boiling.
- ③ The warm water for washing hands.
- ④ The water-sprinkled path.

問 4 Which of the following is true? 

45
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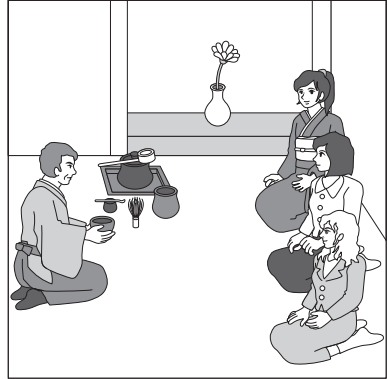
- ① Everyone ate lunch before they came to the teahouse.
- ② Hitomi seemed never to want to go back to the class.
- ③ That day Elizabeth suffered from kneeling formally for a long time.
- ④ The three women enjoyed the tea ceremony held by Mr. Tanaka.

問 5 Which of the following pictures best matches the situation in the teahouse before the people ate lunch? 46

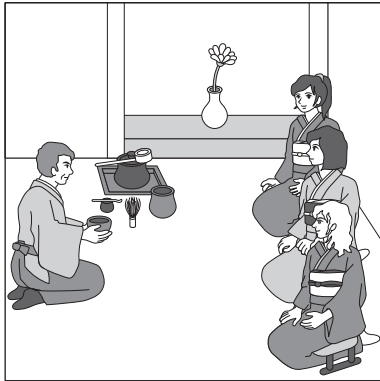
①



②



③



④



(下 書 き 用 紙)

英語(筆記)の試験問題は次に続く。

**第6問** 次の文章を読み、下の問い(A・B)に答えよ。なお、文章の左にある(1)～(6)は段落の番号を表している。(配点 36)

### Space Junk

- (1) Orbital debris is “junk” that is circling Earth — pieces from spacecraft. Humans have been launching objects into space for about 50 years, and most of those objects have fallen back to Earth. A piece of debris falls back to Earth about once a day, either landing or burning up in the atmosphere. Most objects that return to Earth end up in water, but many of the objects sent into space are still in orbit around Earth.
- (2) At one extreme, debris can be as small as tiny flecks of paint or bits of metal that have come off spacecraft. At the other, large debris could be an entire satellite that is no longer working. The most common source of orbital debris larger than 1 centimeter (0.39 inches) is the explosion of objects orbiting Earth. These are often rocket upper sections, which can contain fuel or high-pressure fluids.
- (3) Most “space junk” is moving very fast. It can reach speeds of 4.3 to 5 miles per second. Five miles per second is 18,000 miles per hour, a speed that is almost seven times faster than a bullet. And if a spacecraft is moving toward the debris, the total speed at which they collide can be even faster. The average impact speed of a piece of orbital debris running into another object is 22,370 miles per hour. Being hit by a piece of debris smaller than half an inch across — traveling at about six miles per second — would be like being hit by a bowling ball moving at 300 miles per hour.
- (4) To keep astronauts safe, scientists use radar to keep track of all the debris in orbit. They classify it by its size. About 13,000 known objects are bigger than 10 centimeters in diameter. Scientists believe that there are more than 100,000 pieces of orbital debris between 1 cm and 10 cm across, and tens of millions smaller than 1 cm. All pieces of debris larger than 10 cm are carefully tracked using radar and telescopes. That information is used to

estimate the number of small pieces of debris. To determine how many pieces of very small debris — smaller than 1 millimeter — are in orbit, scientists study the space shuttle when it returns from orbit. They look for damage from debris impacts. When the space shuttle returns from missions, scientists count the number of impacts it experienced. They then compare the number of dents or holes to the amount of space the shuttle traveled through. These comparisons help them estimate how many of the tiny objects are in orbit around Earth.

- (5) Since NASA keeps track of larger debris, spacecraft with crews are able to avoid it. When an object is expected to come within a few miles of the International Space Station (ISS), NASA can slightly change the station's path to avoid the object. And the space station is the most heavily shielded spacecraft ever; it can survive impact with smaller pieces of debris. The debris would hit panels that serve as shields instead of vital parts of the station. Spacesuits also help protect crew members from orbital debris and tiny particles traveling through space when the astronauts are outside the space station. The suits include a layer of strong, thin material that protects astronauts from impacts. This layer is made from the materials used in bulletproof vests.
- (6) As humans launch more and more objects, will Earth orbit turn into a dangerous, crowded junkyard? Space agencies around the world are working to make sure that does not happen. Since 1988, the United States has had an official policy to keep the creation of new orbital debris to a minimum. NASA looks for ways to create less orbital debris; it also looks for ways to get rid of debris that is already in space. Many US aerospace companies also follow guidelines to reduce the creation of debris. The Russian, Japanese, French and European space agencies are keeping the creation of new debris low, too.

A 次の問い(問1～5)の 47 ～ 51 に入れるのに最も適当なものを、それぞれ下の①～④のうちから一つずつ選べ。

問1 According to paragraphs (1) and (2), orbital debris 47 .

- ① can be useful to human beings on Earth
- ② is made up of objects that will never return to Earth
- ③ is mostly caused by the explosion of planets
- ④ probably did not exist a hundred years ago

問2 Based on paragraph (3), which of the following is true? 48

- ① Even a tiny piece of debris can hit and damage spacecraft.
- ② Larger debris is moving faster than smaller debris.
- ③ Most debris moves more slowly than a bullet.
- ④ The shape of debris is very much like that of a bowling ball.

問3 In paragraph (4), the author suggests that 49 .

- ① even the largest pieces of orbital debris are smaller than 10 cm in diameter
- ② scientists help astronauts calculate how many tiny objects are orbiting around Earth
- ③ scientists monitor debris circulating around Earth for the safety of astronauts
- ④ the space shuttle has never experienced collisions with space debris



問 4 According to paragraph (5), to protect the ISS and its crew from impact with space debris, NASA 

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- ① can slightly change its course when objects are coming toward it
- ② has made bulletproof vests for its crew to wear in case of emergency
- ③ has ordered its crew never to work outside the station
- ④ is going to shield the station more heavily than ever

問 5 According to paragraph (6), space agencies around the world 

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- ① are trying to create as little new debris as possible
- ② have decided that debris should be left as it is
- ③ have set a goal of reducing debris to zero
- ④ should not launch satellites any more

**B** 次の表は、本文の段落と内容をまとめたものである。 52 ～ 55 に入るのに最も適当なものを、下の①～④のうちから一つずつ選び、表を完成させよ。ただし、同じものを繰り返し選んではいけない。

Paragraph	Content
(1)	What is orbital debris?
(2)	<span style="border: 1px solid black; padding: 0 5px;">52</span>
(3)	<span style="border: 1px solid black; padding: 0 5px;">53</span>
(4)	<span style="border: 1px solid black; padding: 0 5px;">54</span>
(5)	<span style="border: 1px solid black; padding: 0 5px;">55</span>
(6)	What are space agencies doing about debris?

- ① How big is orbital debris?
- ② How can the space station and astronauts stay safe?
- ③ How fast does debris move?
- ④ How much debris is there in orbit?











