英　語

（問　題）

2020 年度

〈R 02141119〉

注 意 事 項

1. 試験開始の指示があるまで、問題冊子および解答用紙には手を触れないこと。
2. 問題は 2 ～ 11 ページに記載されている。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損等に気付いた場合は、手を挙げて監督員に知らせること。
3. 解答はすべて、ＨＢの黒鉛筆またはＨＢのシャープペンシルで記入すること。
4. マーク解答用紙記入上の注意
 （１）印刷されている受験番号が、自分の受験番号と一致していることを確認したうえで、氏名欄に氏名を記入すること。
 （２）所定欄以外に受験番号・氏名を記入した解答用紙は採点の対象外となる場合がある。
 （３）マーク欄にははっきりとマークすること。また、訂正する場合は、消しゴムで丁寧に、消し残しがないようによく消すこと。

マークする時	● 良い　◐ 悪い　◯悪い
マークを消す時	◯ 良い　◐ 悪い　◯悪い

5. 解答はすべて所定の解答欄に記入すること。所定欄以外に何かを記入した解答用紙は採点の対象外となる場合がある。
6. 試験終了の指示が出たら、すぐに解答をやめ、筆記用具を置き解答用紙を裏返しにすること。
7. いかなる場合でも、解答用紙は必ず提出すること。

〔 I 〕　　次の英文（ i ）〜（ viii ）を読んで、設問 **1** 〜 **25** の解答として最も適当なものを、（ A ）〜（ D ）の中から選びなさい。

（ i ）　　Watch a robot attempt a task it hasn't been explicitly trained to do, and it'll fall flat on its face or just give up and catch on fire. And teaching a robot to do something new is exhausting, requiring line after line of code and joystick tutorials in say, picking up an apple. But new research out of the University of California, Berkeley, is making learning way easier on both the human and machine: By drawing on prior experience, a humanoid-ish robot called PR2 can watch a human pick up an apple and drop it in a bowl, then do the same itself in one try, even if it's never seen an apple before. It's not the most complex of tasks, but it's a big step toward making machines rapidly adapt to our needs, fruit-related or otherwise.

Consider the toothbrush. You know how to brush your teeth because your parents showed you how ― put water and paste on the bristles and put the thing in your mouth and scrub and then spit. You could then draw on that experience to learn how to floss. You know where your teeth are, and you know there are gaps between them, and that you have to use an instrument to clean them. Same principle, but kind of different.

1.　What must be done to teach traditional robots?
　　(A) Coding
　　(B) Learning
　　(C) Showing
　　(D) Watching

2.　How can PR2 learn so quickly?
　　(A) Experience
　　(B) Practice
　　(C) Tutorials
　　(D) All of the above

3.　How might the new robot's learning be described?
　　(A) Exhausting
　　(B) Explicit
　　(C) Flawless
　　(D) Principled

4.　What is a benefit of this new type of robot learning?
　　(A) Adaptability
　　(B) Ease of use
　　(C) Transferability
　　(D) All of the above

(**ii**)　　Nearly all public school teachers report digging into their pockets to pay for school supplies, spending nearly $480 a year, far more than the federal $250 tax deduction available to teachers. The findings by the National Center of Education Statistics released Tuesday come as teachers across the country are walking out of classrooms to protest low pay and demand pay raises. Helping teachers pay for class supplies was a key demand during the Arizona teachers' strike.

Ninety-four percent of public school teachers say they spent their own money on notebooks, pens and other supplies during the school year without reimbursement, according to the study. The average amount spent was $479. About 44 percent spent $250 or less, while 36 percent spent $251 to $500. Currently, teachers who spend their personal money on children's classroom needs are able to reduce their taxable income by $250. That amounts to roughly $30-$60 in savings for each teacher, according to the American Federation of Teachers, a relatively small sum.

Teachers pushed back strongly last year when the tax bill passed by the House of Representatives called for eliminating the deduction altogether. The Senate version of the bill, meanwhile, sought to raise the deduction to $500. In the end, the two chambers reached a compromise, and the deduction remained unchanged.

5. What did teachers do in Arizona?
   (**A**)　Demanded financial assistance for school supplies.
   (**B**)　Proposed a bill to the House of Representatives and the Senate.
   (**C**)　Received $479 in tax deductions.
   (**D**)　Requested a sharp increase in their monthly salary.

6. How did the House of Representatives and Senate resolve the tax deduction issue?
   (**A**)　Compromised.
   (**B**)　Eliminated.
   (**C**)　Pushed.
   (**D**)　Raised.

7. What is the best title for this passage?
   (**A**)　Parents Support Tax Deduction for Teachers
   (**B**)　Teachers Spend Their Own Money on School Supplies
   (**C**)　Teachers Walking Out of Classrooms to Protest Low Pay
   (**D**)　Two Chambers' Compromise on Teachers' Salaries

(iii)   The promise of domestic robots that offer companionship or perform basic chores has tantalized the technology industry for decades. Nolan Bushnell, the founder of Atari, introduced the three-foot-tall, snowman-shaped Topo Robot back in 1983. Though it could be programmed to move around by an Apple Il computer, it did little else and sold poorly. Subsequent attempts to produce useful robotic servants in the U.S., Japan and China over the years have performed only marginally better. iRobot Corporation's Roomba, which only does one thing — vacuum — is the standout in the field and has sold more than 20 million units since 2002.

More recently, Sony and LG Electronics have shown interest in the category. In January at the Consumer Electronics Show, LG showed off a robot called Cloi in a demonstration that failed multiple times. Sony demonstrated a new version of a robotic dog called Aibo, which it sold a version of until the mid-2000s after first unveiling the concept about 20 years ago. It doesn't do much other than bark (although Aibo has been programmed to play soccer). The canine bot also costs $1,800, or about the same price as a real dog from a breeder.

Advances in computer vision technology, cameras, artificial intelligence and voice activation help make it feasible for Amazon to bring a robot to the marketplace. The retail giant has shown itself willing to partially subsidize the costs of its devices for Prime subscribers who buy more products and subscribe to services through its gadgets. That could also make such a product more affordable for mainstream consumers in the future. The consumer robot market will be worth about $15 billion a year by 2023, according to an estimate from Research and Markets, which would be up from about $5.4 billion this year.

8. What could Amazon do to successfully sell domestic robots?
    (A) Activate.
    (B) Mainstream.
    (C) Subscribe.
    (D) Subsidize.

9. Which domestic robot has been the most successful?
    (A) Aibo
    (B) Cloi
    (C) Roomba
    (D) Topo Robot

10. What is the main idea of this passage?
    (A) Amazon could succeed with a domestic robot where others have failed.
    (B) Attitudes must change before consumers adopt household robots.
    (C) There is high consumer demand for domestic robots in many countries.
    (D) All of the above

(**iv**)   Vitamin D — the "sunshine vitamin" — is best known for its role in bone and brain health. But a collection of evidence suggests that it can also protect against cold and flu, according to a new scientific review of 25 published studies. The new research supports the theory that it also boosts immunity and helps fight acute respiratory infections.

Several observational studies have linked low vitamin D levels to greater susceptibility to respiratory infections. However, clinical trials on vitamin D supplementation have had conflicting results, with only some finding significant benefits. For the new study, a meta-analysis published in the British Medical Journal, researchers looked at individual data from nearly 11,000 people who had participated in randomized controlled trials in more than a dozen countries.

The researchers found that people who took daily or weekly vitamin D supplements were less likely to report acute respiratory infections, like influenza or the common cold, than those who did not. Those who had low vitamin D levels before they started supplementation got the biggest benefit: For people with the most significant vitamin D deficiencies (blood levels below 10 mg/dl), taking a supplement cut their risk of respiratory infection in half. People with higher vitamin D levels also saw a small reduction in risk: About 10%, which is about equal to the protective effect of the injectable flu vaccine, the researchers say. No significant benefits were associated with high doses of vitamin D spaced out over larger periods of time.

11. Which group benefitted the most from taking vitamin D supplements?
   (**A**) People with high vitamin D levels
   (**B**) People with low vitamin D levels
   (**C**) Those who took daily or weekly supplements
   (**D**) None of the above

12. What lesson can be learned from this passage?
   (**A**) Clinical trials produce better results than observational studies.
   (**B**) Drawing data from many studies can yield useful results.
   (**C**) Too many scientific studies produce conflicting results.
   (**D**) Vitamin D levels are a good indicator of one's health.

13. Which conclusion is supported by the data?
   (**A**) More vitamin D produces more benefits.
   (**B**) People with low vitamin D levels benefitted the most.
   (**C**) Taking vitamin D helps recovery from respiratory infections.
   (**D**) Those with higher vitamin D levels benefitted the most.

(**v**)　　Does your morning start only after your first (or second) cup of coffee or mug of tea? You're not alone: It's estimated that 85% of U.S. adults consume caffeine, the world's most widely used central nervous system stimulant. Most of those folks get their caffeine through coffee, but it's also in chocolate, tea, soda pop, and even painkillers.

Caffeine shakes out the cobwebs, making you feel more mentally alert. But it can also disrupt your sleep or make you anxious or jittery, especially if you're sensitive to it or consume too much. "Clearly some people are more sensitive to the physiological effects of caffeine than others and would benefit from keeping coffee to a minimum or switching to a decaffeinated variety," says Robin Poole, MB ChB, a researcher at the University of Southampton in the U.K., who has reviewed the health effects of coffee.

It's worth noting, says Connie Weaver, PhD, distinguished professor in the department of nutrition science at Purdue University, that research to separate the benefits of coffee versus caffeine are lacking. In fact, recent research from the University of Southern California Keck School of Medicine tied both regular and decaffeinated coffee consumption to a lower risk of death due to heart disease, cancer, stroke, diabetes, and respiratory and kidney diseases.

14. How is worldwide caffeine use described?
　　(**A**) Contained in few products.
　　(**B**) Most widely used stimulant
　　(**C**) Used by 85% of adults.
　　(**D**) All of the above

15. How do the health benefits of coffee and caffeine compare?
　　(**A**) Caffeine is the stronger stimulant.
　　(**B**) Caffeine reduces the risk of various illnesses.
　　(**C**) Coffee dilutes caffeine's effect.
　　(**D**) More studies are needed.

16. What conclusion could one draw from this passage?
　　(**A**) Caffeine in coffee may not be the source of health benefits.
　　(**B**) Coffee consumption is key to a healthy lifestyle.
　　(**C**) Coffee is the primary source of caffeine in adults worldwide.
　　(**D**) Research shows that caffeine may provide health benefits.

(**vi**)   Can pets get the flu? And if you're sick yourself, can you pass it along to them? Yes and no, says Colin Parrish, Ph.D., professor of virology at Cornell University College of Veterinary Medicine. Dogs can and do get canine influenza, he says, but it's caused by different strains of viruses than the ones humans most often catch. There are no reports of humans contracting canine flu, and it's extremely rare that dogs get human flu. In other words, good news: Close contact with your pup when you have the flu is an extremely low-risk situation. That being said, there are things you can do to protect your best friend from the kind of flu that really can make them sick.

Some background first: In terms of symptoms, canine flu is very similar to human flu. "It's a respiratory virus, so dogs cough a lot, they get a fever, they don't feel well," says Parrish. "But 99 percent of the time they recover uneventfully." Like human flu, though, rare cases of dog flu can be severe or even life threatening. "We don't always know why this happens," says Parrish, "but it could be that a dog gets a mixed infection with other pathogens, or is very young or very old or has a particularly weak immune system for some other reason." Luckily, canine flu isn't prevalent all the time across the entire country. Outbreaks do occur, however, like the one that's been going on for a few years in Chicago and across the Midwest, or the several hundred cases reported in and around Atlanta in 2015.

17. How do human flu and dog flu virus strains compare?
    (**A**) Different
    (**B**) Prevalent
    (**C**) Related
    (**D**) Similar

18. What is the possibility of contracting another species' flu virus?
    (**A**) Dogs can get human flu.
    (**B**) Humans can get dog flu.
    (**C**) The possibility is similar for both.
    (**D**) All of the above

19. Why do dogs sometimes die from the flu?
    (**A**) Mixed infections
    (**B**) Very young or very old
    (**C**) Weak immune systems
    (**D**) Not enough information given

(**vii**)　Computer scientists at Columbia Engineering have invented FontCode, a new way to embed hidden information in ordinary text by imperceptibly changing, or <u>perturbing</u>, the shapes of fonts in text. FontCode creates font perturbations, using them to encode a message that can later be decoded to recover the message. The method works with most fonts and, unlike other text and document methods that hide embedded information, works with most document types, even maintaining the hidden information when the document is printed on paper or converted to another file type.

"While there are obvious applications for espionage, we think FontCode has even more practical uses for companies wanting to prevent document tampering or protect copyrights, and for retailers and artists wanting to embed QR codes and other metadata without altering the look or layout of a document," says Changxi Zheng, associate professor of computer science and the paper's senior author.

"Changing any letter, punctuation mark, or symbol into a slightly different form allows you to change the meaning of the document," says Xiao, the paper's lead author. "This hidden information, though not visible to humans, is machine-readable just as barcodes and QR codes are instantly readable by computers. However, unlike barcodes and QR codes, FontCode doesn't mar the visual aesthetics of the printed material, and its presence can remain secret."

20. Which word means about the same thing as the underlined word, <u>perturbing</u>?
　(**A**) Altering
　(**B**) Embedding
　(**C**) Encoding
　(**D**) Messaging

21. How does FontCode text look to the human eye?
　(**A**) Changed
　(**B**) Embedded
　(**C**) Encoded
　(**D**) Unaltered

22. What applications are there for FontCode messages?
　(**A**) Embedding codes
　(**B**) Espionage
　(**C**) Protecting copyrights
　(**D**) All of the above

(viii)   Feeding seaweed to cows could slash the amount of climate change-inducing methane emissions from their burps. Preliminary research has indicated a small amount of marine algae added to cattle food can reduce methane emissions from cattle gut microbes by as much as 99%. Now, scientists in California are hoping to help farmers meet strict new emissions targets by performing the first ever tests of seaweed feed in live dairy cows.

While their early results are yet to be released, team leader Professor Ermias Kebreab at the University of California, Davis, said their initial experiments were "very surprising and promising." "Results are not final, but so far we are seeing substantial emission reductions," he said. "This could help California's dairy farmers meet new methane-emission standards and sustainably produce the dairy products we need to feed the world."

Cow digestion relies on millions of microbes in their guts processing and fermenting high-fiber foods. This process allows the animals to survive on a diet of grass, but it also produces large quantities of methane — a gas responsible for around a quarter of man-made global warming. Cattle constantly burp and emit the methane being produced in their stomachs. The gas can also be expelled from their rear ends and from manure, but to a lesser extent. Agriculture is a major contributor to greenhouse gas emissions, and around a third of the emissions from the sector are thought to come from livestock producing methane.

23. What is the goal of feeding seaweed to cows?
   (**A**) Improve nutrition.
   (**B**) Nourish livestock.
   (**C**) Reduce methane.
   (**D**) All of the above

24. What was Professor Kebreab's reaction to the preliminary results?
   (**A**) Hope
   (**B**) Optimism
   (**C**) Surprise
   (**D**) All of the above

25. What produces large quantities of methane?
   (**A**) Grass
   (**B**) Manure
   (**C**) Microbes
   (**D**) Rear ends

〔**II**〕　次の設問 **26** 〜 **40** の空所を補うものとして最も適当な語を、（ A ）〜（ K ）の中から選びなさい。ただし、使われない語が含まれていることもあります。また、同じ語を繰り返して使うこともできます。空所に何も補う必要のない場合には（ **L** ）を選びなさい。

（ A ） against	（ B ） around	（ C ） between	（ D ） by	（ E ） for	（ F ） in
（ G ） off	（ H ） on	（ I ） over	（ J ） to	（ K ） up	（ L ） NO WORD

26. There's an old saying that "the early bird catches _____ the worm."

27. I didn't get a salary increase this year so I'll have to get _____ on my current pay.

28. My friend and I wanted to see the show, but _____ the two of us, we didn't have enough money.

29. Now that you've graduated from high school, you need to be responsible _____ your actions.

30. The shipwrecked crew miraculously survived _____ all odds on the tiny island.

31. The laborers worked in three shifts _____ the clock to maximize the factory's output.

32. Bob was torn _____ having dinner with his family or going to the movies with his friends.

33. I asked James how much the house over there costs. He said, "_____ the top of my head, I'd say it's ¥50,000,000."

34. Bill initially questioned the report's findings, but he eventually came _____ he same conclusions.

35. The professor's new theory did not go _____ well with some researchers in his field.

36. I was able to avoid the traffic jam so I will be _____ home sooner than I had planned.

37. The question under discussion remains unanswered _____ the best of our knowledge.

38. It's become so hot and humid that Bob takes his walks early _____ the morning.

39. You might as well take him _____ on his offer to help you move into your new apartment.

40. I was convinced that he took the book, but it had just been put _____ the wrong shelf.

〔Ⅲ〕 次の設問 **41 ～ 50** の **A ～ D** のうち、誤った英語表現を含んだ部分がある場合には
A ～ D の中の一つを、誤りがない場合には **E** を選びなさい。

41. There wasn't <u>much time</u> before we <u>had to leave</u> so I took <u>a fast shower</u> and <u>left the house</u>.
               A   **B**   **C**   **D**
    NO ERROR
       E

42. <u>At the zoo</u>, my friends <u>laughed at me</u> when I <u>was startled by</u> the <u>lion's shout</u>.   NO ERROR
      A   **B**   **C**   **D**   **E**

43. No matter <u>how hard</u> <u>I tried</u>, I simply <u>could not make</u> myself <u>understand to</u> the local people.
                 A   **B**   **C**   **D**
    NO ERROR
       E

44. <u>After an investigation</u>, the manager <u>was accused</u> <u>for talking</u> the diamonds <u>from the store</u>.
         A   **B**   **C**   **D**
    NO ERROR
       E

45. Mary has <u>always been careful</u> <u>about her health</u>, but she was <u>the only one</u> of our friends
              A   **B**   **C**
<u>to catch the flu</u>.   NO ERROR
    D   **E**

46. The organization <u>is composed with</u> <u>former teachers</u>, <u>concerned parents</u>, and <u>others interested in</u>
                 A   **B**   **C**   **D**
education.   NO ERROR
         E

47. It was cold <u>at the lake house</u> so I <u>spent the afternoon</u> <u>cutting woods for the fire</u> <u>to keep us warm</u>.
               A   **B**   **C**   **D**
    NO ERROR
       E

48. <u>If I were you</u>, I <u>would be</u> careful <u>not to leave</u> any money <u>lying around the office</u>.   NO ERROR
      A   **B**   **C**   **D**   **E**

49. The seven o'clock news <u>this morning</u> <u>tells it</u> <u>is going to be</u> unseasonably cold <u>all day long</u>.
                        A   **B**   **C**   **D**
    NO ERROR
       E

50. Barbara <u>has never had</u> such <u>a frightened experience</u> <u>as she did</u> driving home <u>the other day</u>.
          A   **B**   **C**   **D**
    NO ERROR
       E

〔以 下 余 白〕