

2026학년도 편입학전형

필기고사 문제지

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(영어 / 수학)

(각 20문항 4지선다형)

시험시간 : 100분

지원학부(과) :

수험번호 :

성명 :

한 국 항 공 대 학 교

필기고사 (영어 / 수학)

■ 유의사항

1. 시험시간은 100분입니다.
2. 답안 작성은 반드시 “컴퓨터용 싸인펜”을 사용하십시오.
3. 수정 펜/수정 테이프 사용을 불허하며, 수정이 필요하면 답안지를 교체하십시오.
4. 답안지에 불필요한 사항을 기재(표시)하지 마시오.
5. [] 안의 숫자는 배점입니다.

영 어

[1-5] Choose the word that is closest in meaning to the underlined expression.

[각 4점]

1. His speech was filled with pretentious claims that impressed few but amused many.
 ① practical ② pompous ③ constructive ④ pragmatic
2. The committee labeled the proposal redundant and recorded the designation in the official minutes for future reference.
 ① tentative ② worthwhile ③ unnecessary ④ cohesive
3. The historian characterized the ruler as autocratic in a biography.
 ① authoritarian ② empathetic ③ reliable ④ cautious
4. The philosopher presented a superficial explanation during a lecture that introduced several abstract concepts to audience.
 ① concrete ② plausible ③ comprehensive ④ insubstantial
5. The director introduced a new remedial policy during the meeting to address the issues in the project.
 ① rectifying ② wholesome ③ appealing ④ advantageous

[6-8] Choose the one that best completes the sentence.

[각 4.6점]

6. As the world's thirst for coffee shows no signs of slowing down, widely used practices to ramp up the crop's production have become self-defeating. In Brazil, the world's biggest coffee producer, coffee farming is driving deforestation. Scientists have shown how deforestation leads to less rainfall in tropical rainforests. That's because the trees there soak up and release moisture, which rises to create clouds and more rain. Cutting down trees disrupts the cycle, reducing rainfall and leading to drought. Drought, of course, makes it harder to grow coffee. Farmers are expanding to respond to the world's insatiable demand for coffee, and to produce that coffee, they need land. Simple as that. And this, _____, makes coffee cultivation more challenging.

- ① by coincidence ② on the contrary ③ in turn ④ at any rate

7. Probiotics, which contain a mix of live, beneficial bacteria, can help prevent a very serious intestinal inflammation in preemies. Then, could giving probiotics to healthy babies lead to any measurable health benefits later in life? The answer is: For now, no one knows. Researchers are years away from being able to pin down whether altering a healthy baby's gut with probiotics could lead to any measurable reduction

in disease. "What these findings mean for health _____, we don't really know yet," a researcher says. For now, probiotics have been shown to be effective for certain conditions in babies and kids. For instance, probiotics can help prevent diarrhea in children taking antibiotics. And, recent studies show probiotics can help reduce crying in breastfed babies with colic.

① all the while

② from scratch

③ down the road

④ around the corner

8. Last summer's hailstorm in Cozad caused an estimated \$100 million in property damage, an enormous sum for a town of just 4,000 people. And that has led to enormous bills for property insurance companies. One of the biggest complaints among Cozad residents is that, even as they shell out more for property insurance, that insurance is covering less. Many people in town now have policies with higher _____, meaning that they need to pay thousands or even tens of thousands of dollars out of their own pockets before the insurance kicks in. And many new policies also don't cover the full cost of replacing a damaged roof, which is often the most expensive repair after a hailstorm.

① deductibles

② fines

③ reimbursements

④ premiums

[9] Choose the one that is either ungrammatical or unacceptable.

[5점]

9. Meta, YouTube, TikTok and Snapchat know exactly how addictive their platforms can be ① to teens. And they continue to target teen users anyway. A newly unsealed legal filing paints a picture of firms well aware that their apps could harm teens and children, yet pursuing young users anyway ② to juice engagement and profit. It also cites internal documents suggesting the companies acknowledge that their wellbeing and parental control features have limited effectiveness. The companies face growing legal pressure. In addition to the Northern California case, the four companies are defendants in a consolidated lawsuit in Southern California claiming that they harmed young people's mental health, ③ which is set to go to trial in January. Each of the four companies ④ have rolled out a series of youth safety and parental control features in recent years, such as "take a break" reminders, content restrictions for young users and default privacy protections. However, Friday's filing alleges that, at least in some cases, the companies are aware those tools have limited efficacy.

[10-13] Choose the best for the blank.

[각 4.8점]

10. There are many important reasons to manage the world's wild fisheries. We do it to maintain stock levels, to ensure biodiversity and because fish are valuable. But researchers say there's something else in need of protection: The very people who

rely on fish for food. Scientists are predicting more than 10 percent of the world's population, 845 million people, will experience deficiencies in critically important micronutrients including zinc, iron, and vitamin A in the coming decades if global fish catches continue to decline. Scientists call it a _____ for countries like Indonesia, the Philippines, Malaysia and others that rely heavily on wild-caught fish for sustenance, and cautions the findings are just the tip of the iceberg. It's in these regions, close to the Equator, where nutrition is highly dependent on wild seafood, and where fisheries are most at risk from illegal fishing, weak governance, poor knowledge of stock status, population pressures and climate change.

- ① fisheries renaissance ② global footnote
③ perfect storm ④ climate spiral

11. Just blocks from the Presidio of San Francisco, the national park at the base of the Golden Gate Bridge, stands a gleaming white building with eight striking gothic columns. But what was once the home of a Christian church is now the holy grail of Internet records, the Internet Archive, a non-profit library run by a group of software engineers and librarians who for nearly 30 years have been saving the web one page at a time. Inside the sanctuary, the sounds of church sermons have been replaced by the hum of servers, where the Internet Archive's Wayback Machine preserves web pages. It has proven critical for academics and journalists searching for information on what corporations, people and governments have published online in the past, long after their websites have been updated or changed. So, for many, the Wayback Machine is like _____. Archiving the web is more important and more challenging than ever before. Artificial intelligence is blurring the line between what's real and what's artificially generated, in some ways replacing the need to visit websites entirely.

- ① a living history of the Internet materials
- ② an early AI-powered version of the Internet
- ③ a revised archive of historical records
- ④ an online repository of religious content

12. We might be Martians. The evidence seems to be building that we are actually all Martians: _____. There is a scientific phrase for this: panspermia. It's the fact that when asteroids slam into planets, they send up showers of matter that can be sent soaring through space as meteorites and land on other planets. Our larger planet's greater gravity, warmer temperatures and magnetic field allowed minute organisms borne here from Mars to eventually evolve into the kinds of life we see around us now, from flowers, grass and Lake Michigan to gnats, elephants, and Miley Cyrus. There are other scientists who find this thinking interesting but unconvincing.

An astrobiologist told that it's a plausible story but unproven, believing it's just as possible that life emerged from Earth's own pre-biotic homebrew.

- ① life forms like flowers and grass were carried by meteorites from Mars
- ② tiny organisms emerged on Earth
- ③ meteorites carrying organisms were landing on Mars
- ④ life originated on Mars and came to Earth on a rock

13. Among the success stories of rescuing rare animals from extinction is the whooping crane. Seventy years ago there were only about 16 birds left on the planet. Now there are about 600. But breeding more birds isn't enough. Scientists want to restore the crane's way of life, too. And a team of ecologists have discovered something that suggests they are succeeding: Captive-bred whoopers are picking up tips from older birds about how to skillfully navigate south for the winter. It's a sign that those whooping cranes are passing knowledge from one generation to the next and, in a sense, rebuilding their shared practices. Of course you can teach many animals all sorts of things. Even a mouse can learn to run a maze in a lab. Adult birds teach their young to fly. Chimps teach their offspring how to dig for termites. But in the whooping crane's case, younger birds learned first from humans, then from older birds. And the birds got better at it every year. There is _____.

- ① a decay in shared practices
- ② cultural learning that develops in a large scale process
- ③ purely genetic evolution across generations
- ④ an ecological reflection on migratory patterns

[14-20] Read the following passages and answer the questions.

[각 6점]

[14-15]

About 66 million years ago, just before the mass extinction that wiped out the dinosaurs, a fish chewed up and spit out some sea creatures. Unbeknownst to that fish, its rejected meal was preserved in fossil form. (A) Such a find provides important new knowledge about the relationship between predators and prey and the food chains in the Cretaceous sea. There's a fancy word for fossilized vomit: regurgitalite. (B) The particular fossil, if you look carefully at the image, you see that the edges of the fossils are very sharp and clear. (C) And that tells you that this material did not pass into the digestive system of whatever was doing the chewing. _____, it's not vomit because that means food reaches the stomach. It is called a gastric ejection instead, likened to chewing on and spitting out sunflower seed shells. The predator was attempting to eat sea lilies, also called crinoids. (D) And that's why there are still bits of unchewed crinoid in it. However,

there were thousands of species of fish in the area at the time, so it's not clear what type of fish did the chewing.

14. Choose the words that best fill in the blank.

- | | |
|-----------------|-------------------|
| ① At best | ② To be technical |
| ③ In due course | ④ For example |

15. Find the best place for the following sentence.

This particular mouthful may have been really foul.

- | | | | |
|-------|-------|-------|-------|
| ① (A) | ② (B) | ③ (C) | ④ (D) |
|-------|-------|-------|-------|

[16-17]

When a bunch of chairs are blocking the aisle in a local restaurant, would you choose to contort and squeeze your body around the misplaced chairs, just in case someone had a good reason for putting them there, or move the chairs, so you can quickly sit down and start eating before it gets cold? At least in China, your choice may depend on whether your ancestors farmed rice or wheat. It was claimed that in southern China, centuries of rice paddy cultivation, which requires communities of farmers to work together and rely on each other, led to a modern-day culture that values cooperation and collaboration. And in northern China, wheat farming, a much simpler undertaking that individual farmers could manage on their own, encouraged a culture that emphasizes individualism and self-reliance. To test it out, researchers camped out at restaurants in major Chinese cities: some in north (including Beijing and Shenyang) and some in south (like Shanghai and Guangzhou). The chairs were moved at five restaurants around the country to block aisles and pathways. In Shenyang, 16 percent of customers moved chairs out of their way, living up to a cultural legacy that _____. At the restaurants in Shanghai, only about 6 percent of people moved the chairs. The rest squeezed through the gaps, choosing to not cause too much of a stir, to adjust themselves to their environment rather than bending it to their will.

16. Choose the best for the blank.

- ① prioritizes conforming to the environment around them
- ② dismisses the cultural meanings in farming practices
- ③ restricts a long tradition of regional cultivation
- ④ encourages people to take charge and forge their own path

17. What would be the best title of the passage above?

- ① How our diet impacts on personality development
- ② Human responses to social norms

- ③ How ancestral agriculture shapes modern behavior
④ The influence of regional restaurants on decision-making

[18–20]

New and tougher rules designed to protect coal miners from the coal and silica dust that causes the fatal disease black lung may not be enough to stem an epidemic of the worst stages of the disease or the highest rates of disease in Central Appalachia in 25 years. (A) In response to this, various efforts have been implemented to prevent coal miners from being exposed to excessive and toxic levels of the dust generated as they cut into coal seams. (B) Even so, coal mine operators comply with the new dust control regulations at a rate of more than 99 percent. However, these approaches may not guarantee that exposures will be controlled adequately or that future disease rates will decline, leading mining experts to say that a fundamental shift is needed. In 2016, miners are required to wear dust-sampling devices that can monitor coal dust exposure in real time. (C) Thanks to this, the real-time monitoring gives the miners and mine operators the chance to adapt so that workers are exposed to less dust. They can _____ that sends clean air through the mine to sweep away dust. They can increase the amount of water sprayed on the coal seam as mining machines dig into the coal. They can slow mining machines so they produce less dust. And they can move exposed miners to areas with less or no dust. (D) Nevertheless, the experts found that dust readings may still be inadequate because the new dust monitors do not provide real-time silica dust sampling, which is created when mining machines cut into sandstone and is far more toxic than coal dust alone. Since cutting sandstone has occurred more often in this region, experts call for the development of a real-time sampling monitor for it.

18. Choose the words that best fill in the blank.

- ① boost ventilation ② lower air pressure
③ impair air flow ④ increase dust collection

19. Choose the one that is unacceptable.

- ① (A) ② (B) ③ (C) ④ (D)

20. What can be inferred from the passage above?

- ① Faster speeds of mining machines do not lead to increased dust levels.
- ② Without additional measures, stopping the deadly disease may be out of reach.
- ③ Failure by mining companies to follow dust control rules increased disease rates.
- ④ Both silica dust and coal dust pose the same level of risk.

수 학

1. 함수 $y(x)$ 가 미분방정식 $y'' + 3y' + \frac{5}{2}y = 0$ 과 조건 $y(0) = 0$ 과 $y'(0) = 1$ 을 만족할 때, $y\left(\frac{\pi}{2}\right)$ 의 값은?
[3.9점]

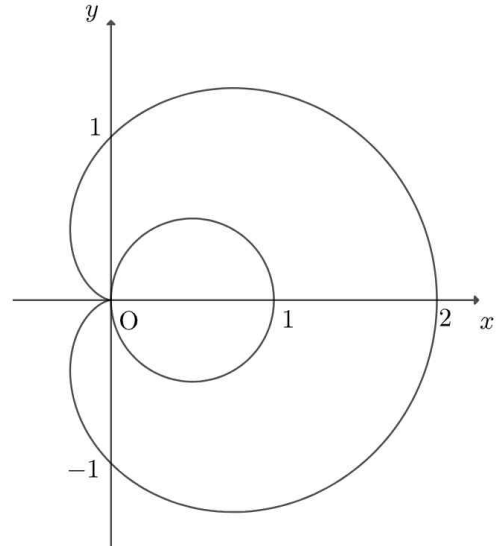
- ① $\sqrt{2} e^{-\frac{3\pi}{4}}$ ② $-\sqrt{2} e^{-\frac{3\pi}{4}}$ ③ $-\frac{\sqrt{2}}{2} e^{-\frac{3\pi}{4}}$ ④ $\frac{\sqrt{2}}{2} e^{-\frac{3\pi}{4}}$

2. 행렬 $A = \begin{bmatrix} 4 & -2 \\ 1 & 1 \end{bmatrix}$ 의 일차독립인 고유벡터 $\vec{v}_1$ 과 $\vec{v}_2$ 의 크기가 각각 1일 때, $|\vec{v}_1 \cdot \vec{v}_2|$ 의 값은? [3.9점]

- ① $\frac{1}{\sqrt{2}}$ ② $\frac{2}{\sqrt{5}}$ ③ $\frac{3}{\sqrt{10}}$ ④ $\frac{3}{2\sqrt{5}}$

3. 극방정식 $r = \cos\theta + 1$ ($0 \leq \theta \leq 2\pi$)의 그래프의 내부와 극방정식 $r = \cos\theta$ ($0 \leq \theta \leq 2\pi$)의 그래프의 외부로 이루어진 영역의 넓이는? [4.1점]

- ① π ② $\frac{9}{8}\pi$
 ③ $\frac{5}{4}\pi$ ④ $\frac{3}{2}\pi$



4. 곡선 C 는 복소평면에서 $|z|=1$ 이며 방향은 반시계 방향인 닫힌 경로일 때, 복소적분 $\oint_C \frac{\sin z}{z^3} dz$ 의 값은? [4.2점]

- ① $-2\pi i$ ② 0 ③ πi ④ $2\pi i$

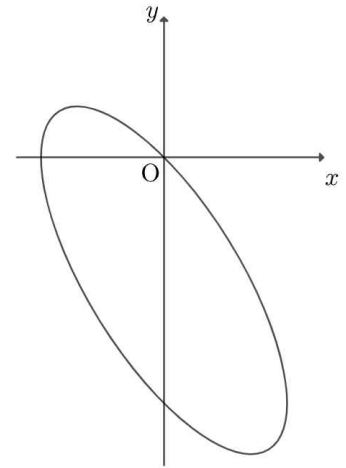
5. 입체 E 의 밑면은 오른쪽 그림의 곡선 $x^2 + (x+y+1)^2 = 1$ 로 둘러싸인 영역이다. 이 입체를 y 축과 평행하면서 밑면과 수직이 되게 자르면 그 단면은 항상 정사각형이 된다. 입체 E 의 부피는? [4.3점]

① $\frac{16}{3}$

② $\frac{8}{3}$

③ $\frac{4}{3}$

④ $\frac{2}{3}$



6. 함수 $y(x)$ 가 미분방정식 $y' = y(1-2y)$ 에 대해 조건 $y(0) = 1$ 을 만족할 때, $y(1)$ 의 값은? [4.4점]

① $\frac{e}{2e-1}$

② $2 - \frac{1}{e}$

③ $\frac{2e}{e-1}$

④ $1 - \frac{1}{2e}$

7. 선형변환 $L: \mathbb{R}^3 \rightarrow \mathbb{R}^2$ 이 $L(\langle 1, 0, 0 \rangle) = \langle 1, -1 \rangle$, $L(\langle 2, 1, 0 \rangle) = \langle 3, 0 \rangle$, $L(\langle 3, 4, 1 \rangle) = \langle 2, 3 \rangle$ 을 만족할 때, $L(\langle 1, 0, -1 \rangle)$ 의 모든 성분의 합은? [4.5점]

① 2

② 3

③ 6

④ 7

8. 정적분 $\int_{-1}^1 \frac{xe^{x^2} + (\tan^{-1}x)^2}{1+x^2} dx$ 의 값은? [4.6점]

① 0

② $\frac{\pi^3}{24}$

③ $\frac{\pi^3}{32}$

④ $\frac{\pi^3}{96}$

9. $a > 0$ 이고 $b > 0$ 일 때, 원형나선 $\vec{r}(t) = a \cos t \vec{i} + a \sin t \vec{j} + bt \vec{k}$ 에 대하여 다음 중 옳은 것의 개수는?
[4.7점]

<보기>

㉠ 단위 접선 벡터는 $\frac{1}{\sqrt{a^2 + b^2}}(a \sin t \vec{i} - a \cos t \vec{j} + b \vec{k})$ 이다.

㉡ 단위 법선 벡터는 $-\cos t \vec{i} + \sin t \vec{j}$ 이다.

㉢ 단위 종법선 벡터는 $\frac{1}{\sqrt{a^2 + b^2}}(b \sin t \vec{i} - b \cos t \vec{j} + a \vec{k})$ 이다.

㉣ 곡률은 $\frac{b}{a^2 + b^2}$ 이다.

- ① 1 ② 2 ③ 3 ④ 4

10. 함수 $y(x)$ 가 미분방정식 $y'' - 3y' - 4y = 6e^{2x}$ 과 조건 $y(0) = 0$ 과 $y'(0) = 2$ 를 만족할 때, $y(\ln 2)$ 의 값은? [4.8점]

- ① 2 ② 12 ③ 24 ④ 48

11. 함수 $y(x)$ 가 미분방정식 $\frac{dy}{dx} + \frac{2}{x}y = \frac{\sin x}{x^2}$ 와 조건 $y(\pi) = \frac{2}{\pi^2}$ 를 만족할 때, $y(1)$ 의 값은? [4.9점]

① $2 + \cos 1$

② $2 - \cos 1$

③ $1 + \cos 1$

④ $1 - \cos 1$

12. 평면 $x + y + z = 1$ 과 원뿔 $z^2 = 2x^2 + 2y^2$ 의 교선과 원점 사이의 거리는? [5.1점]

① $\frac{3}{8}$

② $\frac{\sqrt{6}}{4}$

③ $\frac{5}{8}$

④ $\frac{\sqrt{10}}{4}$

13. D 는 평면 $x+2y=1$, $x+2y=2$, $x-z=0$, $x-z=2$, $2y-z=0$, $2y-z=3$ 으로 둘러싸인 도형일 때,

삼중적분 $\iiint_D (x-z) dV$ 의 값은? [5.3점]

① $\frac{1}{4}$

② $\frac{3}{2}$

③ 4

④ 6

14. 주기가 2인 함수

$$f(x) = \begin{cases} 0 & (-1 < x < 0) \\ 2\sin\pi x & (0 \leq x < 1) \end{cases}$$

를 $f(x) = a_0 + \sum_{n=1}^{\infty} (a_n \cos n\pi x + b_n \sin n\pi x)$ 형태로 나타낼 때, a_2 와 b_1 의 곱은? [5.4점]

① $\frac{2}{\pi}$

② 0

③ $-\frac{4}{3\pi}$

④ $-\frac{8}{3\pi}$

15. 영역 D 가 $\{(x, y, z) | 1 \leq x^2 + y^2 \leq 4, -1 \leq z \leq 2\}$ 일 때, 벡터함수

$$\vec{F}(x, y, z) = \ln(x^2 + y^2) \vec{i} - \left(\frac{2z}{x} \tan^{-1} \frac{y}{x} \right) \vec{j} + z\sqrt{x^2 + y^2} \vec{k}$$

의 영역 D 의 경계면 밖으로의 선다발(flux)은? [5.5점]

- | | |
|---------------------|----------------------|
| ① $\pi(7 + 4\ln 2)$ | ② $2\pi(4 - 2\ln 2)$ |
| ③ $\pi(2 + 4\ln 2)$ | ④ $2\pi(7 - 3\ln 2)$ |

16. 다음 극한값은? [5.7점]

$$\lim_{x \rightarrow 0} \frac{2e^{-x^2} - 2\cos x + x \sin x}{x^4}$$

- | | | | |
|-----------------|-----------------|-----------------|------------|
| ① $\frac{1}{6}$ | ② $\frac{1}{2}$ | ③ $\frac{3}{4}$ | ④ ∞ |
|-----------------|-----------------|-----------------|------------|

17. 다음 중 참인 명제는? [5.9점]

- ① 함수 f 가 모든 실수 x 에 대하여 $|f(x)| \leq |x|^\alpha$ ($\alpha > 1$)를 만족시키면 f 는 $x=0$ 에서 미분가능하다.
- ② 함수 $f(x) = \sqrt[3]{x}$ 는 $x=0$ 에서 미분가능하다.
- ③ $\lim_{x \rightarrow c} f'(x)$ 가 존재하지 않으면 함수 f 는 $x=c$ 에서 미분불가능하다.
- ④ $\lim_{x \rightarrow \infty} f(x) = 1$ 이고 $\lim_{x \rightarrow \infty} g(x) = \infty$ 이면 $\lim_{x \rightarrow \infty} [f(x)]^{g(x)} = 1$ 이다.

18. 다음 거듭제곱급수에 대한 설명 중 옳은 것은? [6.1점]

- ① $\sum_{n=1}^{\infty} \frac{(x-2)^{2n}}{n2^n}$ 의 수렴반지름은 2이다.
- ② $\sum_{n=1}^{\infty} \frac{x^{2n}}{n2^n}$ 의 수렴구간은 $[-\sqrt{2}, \sqrt{2}]$ 이다.
- ③ $\sum_{n=1}^{\infty} \frac{x^{2n}}{n2^n}$ 의 수렴구간의 모든 원소 x 에 대하여 $\sum_{n=1}^{\infty} \frac{x^{2n}}{n2^n} = \ln\left(\frac{2}{2-x^2}\right)$ 이다.
- ④ $\sum_{n=1}^{\infty} \frac{(x-2)^n}{n2^n}$ 의 수렴구간의 모든 원소 x 에 대하여 $\sum_{n=1}^{\infty} \frac{(x-2)^n}{n2^n} = \ln\left(\frac{4-x}{2}\right)$ 이다.

19. 행렬 $A = \begin{bmatrix} 4 & -1 \\ 1 & 2 \end{bmatrix}$ 에 대하여 A^{12} 은? (단, I 는 단위행렬이다.) [6.3점]

- ① $3^{12}(12A - 7I)$ ② $3^{12}(8A - 19I)$ ③ $3^{12}(6A - 15I)$ ④ $3^{12}(4A - 11I)$

20. 행렬 $A = [a_{ij}]_{n \times n}$ 와 대각행렬 $B = [b_{ij}]_{n \times n}$ 가 있다. 모든 $i = 1, 2, \dots, n$ 에 대하여 $\sum_{j=1}^n a_{ij} > 0$ 이고, $b_{ii} > 0$ 이다. <보기> 중 참인 명제는 모두 몇 개인가? [6.4점]

<보기>	
㉠	$\text{tr}(AB) \geq \text{tr}(A)$ 이다.
㉡	$C = BA$ 라 할 때, 행렬 $C = [c_{ij}]_{n \times n}$ 는 모든 $i = 1, 2, \dots, n$ 에 대하여 $\sum_{j=1}^n c_{ij} > 0$ 이다.
㉢	$D = BAB$ 라 할 때, 행렬 $D = [d_{ij}]_{n \times n}$ 는 모든 $i = 1, 2, \dots, n$ 에 대하여 $\sum_{j=1}^n d_{ij} > 0$ 이다.

- ① 0 ② 1 ③ 2 ④ 3