

## 자연계열(영어·수학) 문제지

지원 모집단위	학부(학과)	수험 번호	성 명
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◆ 유 의 사 항 ◆

1. 시험 시간은 100분임
2. 답안지와 문제지에 지원 모집단위, 수험번호, 성명을 반드시 검은색 펜으로 직접 기입하고 마킹을 할 것
3. 답안은 답안지의 해당 문항 번호에 검은색 펜으로 작성할 것
4. 연습은 문제지 여백을 이용할 것

감독위원



이 화 여 자 대 학 교

【1-3】 다음 글을 읽고 물음에 답하시오.

Choosing good names becomes more difficult when a firm markets internationally. Today, through the Internet, even small businesses often do business in several countries. Sometimes the leap from one language to another can be positive; the Chinese pictogram for the sounds of the name Coca-Cola contains the words for “delicious” and “leisure.” More often, though, a problem occurs. The ( Ⓐ ) example of an international naming ( Ⓑ ) is that of the General Motors car called the Nova. Named for an exploding star, the Nova was a reliable car, but its sales were never [A] brisk in Spanish-speaking countries. This was supposedly because Nova could be read as “no va” in Spanish, meaning “It does not go.” In German, the word “mist” means dirt or manure, so Country Mist makeup and the nasal spray Primatene Mist had to be renamed for the German market.

1. 위 글의 문맥상 ( Ⓐ )와 ( Ⓑ )에 들어갈 가장 적절한 낱말은?
- ① classic — error

② typical — mimicry

③ commendable — gaffe

④ sophisticated — juxtaposition
2. 위 글의 문맥상 밑줄 친 [A] brisk의 뜻과 가장 가까운 낱말은?
- ① busy

② fragile

③ anticipated

④ unprecedented
3. 위 글의 내용으로 가장 알맞은 것은?
- ① Playing the name game is not yet a serious business for global companies.

② Brand names should be globally identical for effective marketing and advertising.

③ Product naming techniques are eventually concerned with the knowledge of products.

④ Global marketers should consider any possible negative meanings of brand names in different languages.

【4-6】 다음 글을 읽고 물음에 답하시오.

Henry Ford’s organizational and technological innovations were, in many respects, a simple ( Ⓐ ) of well-established trends. The corporate form of business organization, for example, had been perfected by the railroads throughout the nineteenth century, and had already spread, particularly after the wave of mergers, trust and cartel formation at the end of the century, to many industrial sectors (one third of US manufacturing assets were subject to merger in the years 1898-1902 alone). Ford likewise did little more than rationalize old technologies and a pre-existing detail division of labour, though by flowing the work to the [A] stationary worker he achieved dramatic gains in productivity.

F. W. Taylor’s *The Principles of Scientific Management*—an influential tract which described how labour productivity could be radically increased by ( Ⓑ ) every labour process into component motions and organizing fragmented work tasks according to rigorous standards of time and motion study—had, after all, been published in 1911. And Taylor’s thinking has a long ancestry, going back via Gilbreth’s experiments of the 1890s to the works of mid-nineteenth century writers like Ure and Babbage, which Marx had found so revealing. The separation between management, conception, control, and execution (and all that this meant in terms of hierarchical social relations and de-skilling within the labour process) was also already well under way in many industries.

What was special about Ford (and what ultimately separates Fordism from Taylorism), was his vision, his explicit recognition that mass production meant mass consumption, a new system of the reproduction of labour power, a new politics of labour control and management, a new aesthetics and psychology, in short, a new kind of rationalized, modernist, and populist democratic society.

4. 위 글의 문맥 상 ( Ⓐ )와 ( Ⓑ )에 들어갈 가장 적절한 낱말은?
- ① rendition – casting

② disruption – bundling

③ denial – disintegrating

④ extension – breaking down
5. 다음 중 밑줄 친 [A] stationary와 의미상 가장 가까운 낱말은?
- ① vigilant

② temporary

③ not moving

④ not disciplined
6. 다음 중 위 글의 내용으로 가장 알맞은 것은?
- ① Gilbreth strongly believed in corporate power to regulate the economy as a whole.

② Babbage predicted the arrival of a rationalized, modernist, and populist democratic society.

③ Marx believed that corporate power would become a major impediment to the spread of Fordism.

④ Taylorism allowed virtually no control to the worker over the design, pace, and scheduling of the production process.

【7-8】 다음 글을 읽고 물음에 답하시오.

The concept of a living library was created in Europe, where people of many different races and nations live together in communities. This situation often causes strong feelings of prejudice against immigrants or racial minority groups. A youth NGO, called Stop the Violence, thought that meeting and getting to know people face-to-face would help to break down stereotypes and encourage understanding. In 2000, they began a living library in Denmark. People became books and were [A] “lent out” to readers. Through conversations with the “books,” readers came to realize their own prejudices and misunderstandings.

It is important in a living library to realize that “books” should not be taken as representative figures of the group they belong to. Needless to say, even if they come from “the same shelf,” no two “books” are the same. Each one has its own personality and individuality. This is why “readers” find the “books” so interesting. What a “book” can say about his or her own unique experiences in society creates a stronger response in the “reader” than anything else. That may be a great step forward in trying to understand other people.

7. 밑줄 친 [A] “lent out”의 뜻과 가장 가까운 낱말은?
- ① limited
  - ② recycled
  - ③ borrowed
  - ④ purchased
8. 위 글의 내용과 거리가 먼 것은?
- ① Candid conversations are prerequisite for the success of a living library.
  - ② Each “book” can be regarded as a typical example of the group it belongs to.
  - ③ The racial and national diversity in Europe led to the creation of a living library.
  - ④ “Readers” can expect different stories from different “books” placed in “the same shelf.”

【9-11】 다음 글을 읽고 물음에 답하시오.

The intricate chemistry involved in photosynthesis, the process where plants use sunlight to ( ㉠ ) water and carbon dioxide into sugar, is the most effective solar energy conversion process on Earth. Researchers believe that mimicking parts of it could be the ( ㉡ ) to a limitless supply of clean power. The [A] untapped potential for using the sun’s rays is huge. All human activity for a year could be powered by the energy contained in the sunlight hitting the Earth in just one hour. Harnessing even a smallest amount of this to make electricity or useful fuels could satisfy the world’s increasing need for energy, predicted to double by 2050, without further endangering the climate. Most solar power systems use silicon wafer to generate electricity directly. But although costs are coming down, these are still expensive in many cases when compared with fossil fuels such as coal, oil and gas. At Imperial College London, researchers have embarked on a £1m project to study, and eventually mimic, photosynthesis. Part of this bio-mimicry project called “artificial leaf” involves working out exactly how leaves use sunlight to make useful molecules. The team then plans to build artificial system that can do the same to generate clean fuels such as hydrogen and methanol. These would then be used in fuel cells to make electricity or directly to power super-clean vehicles.

9. 위 글의 문맥 상 ( ㉠ )와 ( ㉡ )에 들어갈 가장 적절한 낱말은?
- ① convert - ticket
  - ② split - compromise
  - ③ combine - hinderance
  - ④ synthesize - obstacle
10. 밑줄 친 [A] untapped의 뜻과 가장 가까운 것은?
- ① not used
  - ② not viable
  - ③ not audible
  - ④ not predictable
11. 위 글의 내용과 가장 거리가 먼 것은?
- ① The proper application of biomimicry can give us many solutions for future energy.
  - ② Our better understanding of nature is conducive to developing sustainable energy.
  - ③ The inevitable exhaustion of fossil fuels in near future will lead us to explore to find alternatives.
  - ④ The soaring demand in electricity should be met with renewable technologies with fewer environmental disadvantages.

【12-13】 다음 글을 읽고 물음에 답하시오.

Lady Constance Lytton’s hunger strikes started in June 1909, throwing fried fish, bananas and hot milk out of the window of her cell. ( ㉠ ) She had been locked up for taking part in suffragette protests, which demanded the right to vote. ( ㉡ ) Asked what she would have for dinner, she replied: “My determination.” To start with, going on hunger strike seemed a brilliant idea for securing early release from jail, since the British government did not want the women behind bars. ( ㉢ ) Women were pinned down while prison doctors rammed long tubes into their nostrils or down their throats. ( ㉣ ) The tubes were not always cleaned between feedings, and some women suffered chipped teeth, others permanently damaged digestion.

12. 위 글의 흐름으로 보아 다음 문장이 들어가기에 가장 적절한 곳은?

In September, the nature of their struggle changed when the government ordered a new policy of force-feeding.

- ① ㉠
- ② ㉡
- ③ ㉢
- ④ ㉣

13. 위 글의 내용과 가장 거리가 먼 것은?

- ① In the beginning, the hunger strike was set for an early release from the prison.
- ② It was only after September 1909 when the suffragettes were treated as criminals.
- ③ Before September 1909, the British government thought it was not civilized to keep the suffragettes in prison.
- ④ The British government’s new policy of force-feeding posed another harsh challenge to the imprisoned suffragettes.

【14-15】 다음 글을 읽고 물음에 답하시오.

The discovery of a new continent? No, it’s a floating island that was found in the Pacific. And, it’s all trash! This has been called “the Great Pacific Garbage Patch.”

Some of the trash comes from ships, but the vast majority of plastic garbage comes from the land. Plastic products like bottles and cups that we throw away in the street get washed away by the rain. They then travel into the sewers, into the rivers, and eventually, into the ocean. The Great Pacific Garbage Patch is created by the Pacific currents pulling in the trash from North America and Asia. This process creates a continent-sized [A] swirl of junk.

According to the United Nations Environment Program (UNEP), the plastic that we find in the oceans is responsible for the deaths of more than a million birds every year. It is also responsible for the deaths of other marine life that lives in these areas. To make matters worse, this plastic island operates as a sponge that absorbs all kinds of persistent pollutants. It means that animals which live in these regions [B] ingest high levels of poisons. Through fishing, these poisons can easily be introduced into our food chain, which suggests that any damage we cause to the planet will return to harm us.

14. 밑줄 친 [A] swirl과 [B] ingest의 뜻과 가장 가까운 낱말은?

- ① gulp - invoke
- ② ranch - absorb
- ③ crumble - vomit
- ④ vortex - consume

15. 다음 중 위 글의 내용과 거리가 먼 것은?

- ① The size of the Great Pacific Garbage Patch can hardly be overlooked.
- ② The Great Pacific Garbage Patch endangers only the lives of ocean birds or animals.
- ③ The trash in the Great Pacific Garbage Patch originated from international sites.
- ④ Our lifestyle is crucially responsible for the increase of plastic garbage in the Pacific Ocean.

<영어 서술형>

【16】 어린 독자들을 위해 다음 글에 제시된 만화의 교육적 효용성이 무엇인지를 자신의 문장으로 정리한 후, 이에 대한 찬성 혹은 반대 입장을 구체적인 예를 들어 서술하시오. (총 200 단어 내외)

Professor Carol Tilley of Illinois University said that comics are just as complex as other forms of reading, and children benefit from reading them as much as they do from reading other kinds of books. She said there was evidence that comics increased students’ vocabulary and instilled a love of reading. Here is what she said in *School Library Monthly* journal.

“A lot of the criticisms of comics come from people who think that kids are just looking at pictures and not putting them together with the words. But you could easily make some of the same criticisms of picture books that kids are just looking at pictures, and not at the words.

Although they’ve long accepted picture books as appropriate children’s literature, many adults—even teachers who willingly add comics to their collections—quickly dismiss the usefulness of comics as texts for young readers.

Any book can be good and any book can be bad, to some extent. It’s up to the reader’s personality and ability. As a whole, comics are just another medium. And if you really consider how the pictures and words work together to tell a story, you can make the case that comics are just as complex as any other kind of literature.”

(※ 주어진 답안지에 글을 쓰시오.)

【17】복소수  $z = 1 + \sqrt{2}i$ 와 그 켤레복소수  $\bar{z}$ 에 대하여,  $\frac{z}{\bar{z}} + \frac{\bar{z}}{z}$ 의 값을 구하시오.

- ①  $-\frac{3}{2}$
- ②  $-\frac{2}{3}$
- ③  $\frac{2}{3}$
- ④  $\frac{3}{2}$

【18】이차방정식  $x^2 + x + 1 = 0$ 의 두 근을  $\alpha, \beta$ 라 할 때,  $(\alpha^4 + 1)(\beta^4 + 1)$ 의 값을 구하시오.

- ① 1
- ② 2
- ③ 3
- ④ 4

【19】세 실수  $a, b, c$ 가

$$a + b + c = 1, \quad ab + bc + ca = -10, \quad \frac{1}{a} + \frac{1}{b} + \frac{1}{c} = -\frac{5}{4}$$

을 만족할 때,  $(1 + a)(1 + b)(1 + c)$ 의 값을 구하시오.

- ① -3
- ② -1
- ③ 0
- ④ 2

【20】전체집합  $U$ 의 두 부분집합  $A, B$ 에 대하여

$$A \cap \{(A \cap B) \cup (A^c \cap B)\} = B$$

가 성립할 때, 다음 중 항상 옳은 것을 찾으시오.

- ①  $A \cup B = B$
- ②  $A \supset B$
- ③  $A^c \supset B^c$
- ④  $A \cup B = U$

【21】이차방정식  $x^2+2ax+b=0$ 가 서로 다른 두 개의 실근을 가질 때, 상수  $a$ 와  $b$ 에 대한 설명 중 항상 옳은 것을 보기에서 찾으시오.

㉠.  $b > 1$ 이면  $a > 1$ 이다.  
㉡.  $a < 1$ 이면  $b < 1$ 이다.

- ① 없음                      ② ㉠                      ③ ㉡                      ④ ㉠, ㉡

【22】모든 실수  $x$ 에 대하여 이차부등식  $ax^2+2x+a \geq 0$ 이 성립하도록 하는 상수  $a$ 의 최솟값을 구하시오.

- ① 1                      ② 2                      ③ 3                      ④ 4

【23】집합  $A = \{(x,y) : (x-1)^2 + (y-1)^2 < 10\}$ 에 대하여,  $(k,2) \in A$ 이고  $(k,-2) \notin A$ 을 만족하는 정수  $k$ 들의 합을 구하시오.

- ① 2                      ② 4                      ③ 6                      ④ 8

【24】유리함수  $y = \frac{4x+1}{2x-2}$ 의 두 점근선이 만나는 교점을  $(a,b)$ 이라 할 때,  $b-a$ 의 값을 구하시오.

- ① 1                      ② 2                      ③ 3                      ④ 4

【25】 무리함수  $y = \sqrt{1+x} + \sqrt{1-x}$  의 정의역은  $a \leq x \leq b$ 이고, 치역은  $c \leq y \leq 2$ 이다. 이 때  $a-b+c$ 의 값을 구하시오.

- ①  $2 + \sqrt{2}$       ②  $2 - \sqrt{2}$       ③  $-2 + \sqrt{2}$       ④  $-2 - \sqrt{2}$

【26】 함수  $f(x)$ 의 역함수를  $g(x)$ 라 할 때, 함수  $F(x) = f(2x-1)$ 의 역함수  $G(x)$ 를  $g(x)$ 로 표시하시오.

- ①  $g\left(\frac{1}{2}x-1\right)$       ②  $\frac{1}{2}g(x) + \frac{1}{2}$       ③  $g(2x)+1$       ④  $2g(x)-2$

【27】 네 점  $A(1,1)$ ,  $B(5,-1)$ ,  $C(c,3)$ ,  $D(d,5)$ 를 꼭짓점으로 하는 사각형  $ABCD$ 가 마름모일 때, 상수  $c, d$ 의 합을 구하여라. (단,  $d$ 는 음수이다.)

- ①  $-1$       ②  $0$       ③  $1$       ④  $2$

【28】 직선  $x+y=4$  위의 점  $P(a,b)$ 에서 원  $x^2+y^2=1$ 에 그은 접선의 접점을  $Q$ 라 할 때, 삼각형  $\triangle OPQ$ 의 넓이의 최솟값을 구하여라. (단,  $O$ 는 원점을 나타낸다.)

- ①  $\frac{\sqrt{5}}{2}$       ②  $\frac{\sqrt{6}}{2}$       ③  $\frac{\sqrt{7}}{2}$       ④  $\sqrt{2}$

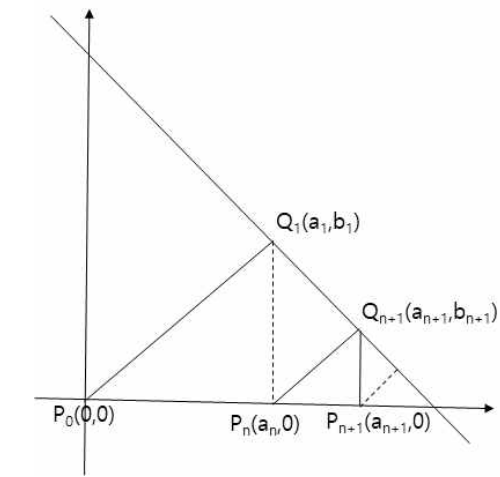
【29】 상용로그  $\log(12\sqrt{30})$ 을 유리수  $a, b, c$ 를 이용하여  $a\log 2 + b\log 3 + c$  꼴로 나타낼 때,  $a+b+c$ 의 값을 구하시오.

- ① 3
- ②  $\frac{7}{2}$
- ③ 4
- ④  $\frac{9}{2}$

【30】 수열  $\{a_n\}$  이  $a_1 = 1, a_{n+1} - a_n = 2n + 1 \ (n \geq 1)$ 을 만족할 때, 급수의 부분합  $S_n = \sum_{k=1}^n a_k$ 의 10번째 항  $S_{10}$ 의 값을 구하시오.

- ① 55
- ② 120
- ③ 286
- ④ 385

【31】 그림과 같이  $x$ 축 위의 한 점  $P_n(a_n, 0)$ 에서 직선  $x+y=1$ 에 수직으로 내리 그은 수선의 발을  $Q_{n+1}(a_{n+1}, b_{n+1})$ 이라 하고,  $Q_{n+1}(a_{n+1}, b_{n+1})$ 에서  $x$ 축에 내리 그은 수선의 발을  $P_{n+1}(a_{n+1}, 0)$ 이라 하자.



원점  $P_0(0,0)$ 에서부터 시작하여 수선의 발  $Q_1, \cdots, P_n, Q_{n+1}, P_{n+1}, \cdots$ 을 무한히 만들 때, 이 점들을 차례로 연결한 선분의 길이의 합

$$L = \overline{P_0Q_1} + \overline{Q_1P_1} + \cdots + \overline{P_nQ_{n+1}} + \overline{Q_{n+1}P_{n+1}} + \cdots$$

을 구하시오.

- ①  $\frac{1+\sqrt{2}}{2}$
- ②  $1+\sqrt{2}$
- ③  $2+2\sqrt{2}$
- ④  $4+4\sqrt{2}$

【32】 상수  $a, b, c$ 에 대하여, 함수  $f(x) = \begin{cases} \frac{x^2 - ax + b}{x - 1} & (x \neq 1) \\ c & (x = 1) \end{cases}$ 가 모든 실수에서 연속일 때 상수들의 합  $a+2b+3c$ 을 구하시오.

- ① 1
- ② 2
- ③ 3
- ④ 4



【33】 닫힌 구간  $[0,3]$ 에서 연속이고 열린 구간  $(0,3)$ 에서 미분가능한 함수  $f(x)$ 가  $f(0)=3$ ,  $f(1)=1$ ,  $f(3)=5$ 를 만족할 때, 다음 설명 중 옳은 것을 모두 고르시오.

- ㄱ. 열린구간  $(0,3)$ 에서  $f'(x)$ 는 최솟값은  $-2$ , 최댓값은  $2$ 이다.

ㄴ.  $f'(c)=0$ 을 만족하는  $c$ 가 열린구간  $(0,3)$ 에 존재한다.

- ① 없음

② ㄱ

③ ㄴ

④ ㄱ, ㄴ

【34】 곡선  $y=x^3-x+1$ 에 접하는 접선  $y=mx+n$ 의 기울기가 2보다 작거나 같을 때, 상수  $n$ 의 최댓값과 최솟값의 차를 구하시오.

- ① 4

② 6

③ 8

④ 10

【35】 정적분을 이용하여,  $\lim_{n\rightarrow\infty}\sum_{k=1}^{2n}\frac{3k^2+2nk+n^2}{n^3}$ 의 값을 구하시오.

- ① 3

② 7

③ 11

④ 14

【36】 0과 1사이의 두 상수  $a,b$ 에 대하여, 정적분  $\int_0^1|x-a|+|x-b|dx$ 의 최솟값을 구하시오.

- ①  $\frac{1}{8}$

②  $\frac{1}{4}$

③  $\frac{3}{8}$

④  $\frac{1}{2}$