

가톨릭대학교 2023학년도 편입학 영어, 수학 A형

(일반·학사·농어촌·특성화) 편입학

모집단위(지원학과) : _____

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가톨릭대학교
THE CATHOLIC UNIVERSITY OF KOREA

2023학년도 가톨릭대학교 편입학 시험 문제지

영어, 수학 (A형)

[1-3] 빈칸에 들어갈 가장 적절한 표현을 고르시오.

1. Some flowers _____ nectar only at a specific time of day when fertilization is to take place; consequently, bees visit these flowers only at that time.

- ① evoke ② pollinate
- ③ repel ④ secrete

2. In the unprecedented pressures of the atomic era, national security needs sometimes came perilously close to _____ the democratic foundations of American life in the time of Cold War.

- ① building on ② complying with
- ③ encroaching on ④ proceeding with

3. Vocal about women's rights, Dr. Amy Smith, a mathematician, has fought hard to _____ the popular belief that women are unable to succeed in math and science.

- ① espouse ② refute
- ③ promulgate ④ validate

[4-5] 빈칸에 들어갈 어법에 맞는 표현을 고르시오.

4. Some philosophers including Descartes claimed that in order to prevent being ensnared in falsehood, philosophers must begin by doubting _____.

- ① whatever can doubt it
- ② whatever it can doubt
- ③ whatever can be doubted
- ④ whatever it can be doubted

5. The cell cycle is an orderly set of stages that take place between the time a cell divides and the time the two cells _____ from that first cell division also divide.

- ① result ② results
- ③ to result ④ resulting

[6-9] 빈칸에 들어갈 가장 적절한 표현을 고르시오.

6. In 1865 Gregor Mendel, an Austrian monk, wrote a paper that laid the foundation for modern genetics. Mendel was the first to demonstrate experimentally the manner in which specific

traits are passed from one generation to the next and to use mathematics to analyze his data. He concluded that discrete, or distinct, hereditary units that passed from parent to offspring determined how traits were inherited. Mendel's findings were _____; their significance, and the hereditary elements he described, were not understood until the early 1900s, when the units became known as genes.

- ① ahead of his time
- ② not really conclusive
- ③ not without criticism
- ④ partially probability-based

7. In a story told from a non-participant (third-person) point of view, the teller of the tale is not a character in the tale. The narrator has receded from the story. If the point of view is omniscient, the narrator relates what he or she wishes about the thoughts as well as the deeds of the characters. The omniscient teller can _____; whereas the first-person narrator can only say "I was angry" or "Jones seemed angry to me," the omniscient narrator can say, "Jones was inwardly angry but gave no sign; Smith continued chatting, but he sensed Jones's anger."

- ① observe major characters from the outside if needed
- ② randomly rearrange the chronological events of the story
- ③ constantly check whether the reader is following the story
- ④ at any time enter the mind of any or all of the characters

8. The fashion business is rife with unauthorized copying but mostly free of infringement lawsuits like the ones the major record labels and film studios frequently face. Because of the rapidity of changing styles, copyright in design is difficult to enforce. Copies or 'knockoffs' _____. Some enterprises never create any original designs, instead specializing in knockoffs. For most of the fashion industry, copying is a way of life. It's expensive and risky to actually create new designs. It's cheaper and easier to simply knockoff successful ones. Typically, designers just let the copies go. After all, new designs will come out in a couple of months, and lawsuits are time-consuming and expensive.

- ① are a reality of the industry
- ② are a nightmare for the industry
- ③ can be detected easily and rapidly
- ④ have become a target of retaliation

9. For many years an automobile was an outstanding example of a status symbol. Automobile manufacturers far too often brought out new models with essentially a change in styling, in silhouette, with additional chrome and more luxurious upholstery. Consumers, in turn, traded in their cars, which were in working condition, because the newer models were more fashionable and were overt evidence of financial status. Unfortunately, for the industry, _____. The high cost of oil, foreign car competition, and inflation, etc., have caused many consumers to rationalize their car purchase behavior. Now they consider the factors of service and cost. The automobile business in the United States is battling a loss of its market share. In turn, the entire economy has been affected adversely.

- ① its enduring success has been overly reliant on product durability
- ② there has been a sharp increase of competition in the global market
- ③ its ability to influence consumers to practice the obsolescence factor has diminished
- ④ there has been a steady shortage of new ideas and new styles in product development

[10-14] 다음 글을 읽고 물음에 답하시오.

10. A tornado is a narrow funnel cloud extending down from a cumulonimbus cloud. Tornadoes are associated with thunderstorms, hurricanes, tropical storms, and strong cold fronts. They have been known to travel as fast as 100 kilometers per hour. Their direction of movement is normally from the southwest to the northeast. At the same time, a tornado's erratic path can complicate the efforts of people to dodge it. It rarely travels in a straight line and may lift up and touch down many times along its path. The horizontal wind and the vertical updraft are the two great destructive forces of a tornado.

Q: What is the passage mainly about?

- ① where tornadoes occur
- ② the movement of tornadoes
- ③ different kinds of tornadoes
- ④ tornado strength and damage

11. When we hear the television weatherman state that there is "a 20 percent chance of rain," he is telling us that the chance of measurable precipitation (0.01 inch or more) in the forecast period is 20 percent at any given location in his forecast area. He considers information from radar, satellites, computer models, climate, and "gut feeling" in making his prediction. Information from all these sources except "gut feeling" is entered into a mathematical model in a computer. It calculates the probability of rain for each forecast period and forecast area. Calculating rain probabilities is not so complex when a general rain is predicted. However, when scattered thunderstorms occur in the summer, the weathermen must consider how much of the forecast area will be affected. Since thunderstorms are more isolated events, one section of the forecast area could receive rain while another nearby section does not.

Q: According to the passage, which of the following is NOT true?

- ① Weathermen may depend on their intuition when they predict precipitation.
- ② Predicting scattered thunderstorms is as complex as calculating rain probability.
- ③ A mathematical model in a computer is usually used for precipitation prediction.
- ④ A measurable amount of rain is defined as 0.01 inch or more for precipitation prediction.

12. Renaissance artists came from all strata of society; they usually studied as apprentices before being admitted to a professional guild and working under the tutelage of an older master. Far from being starving bohemians, these artists worked on commission and were hired by patrons of the arts because they were steady and reliable. Italy's rising middle class sought to imitate the aristocracy and elevate their own status by purchasing art for their homes. In addition to sacred images, many of these works portrayed domestic themes such as marriage, birth and the everyday life of the family.

Q: According to the passage, which of the following is NOT true about the art or artists during the Renaissance?

- ① Artists came from all walks of life.
- ② Many artists suffered financial hardship.
- ③ Purchasing art could be a way to raise one's social status.
- ④ Domestic as well as religious themes were portrayed in artworks.

13. The market is ruled by supply and demand, and as a consumer you can have a huge impact on the demand side of the equation. You can send a signal to the market that people want zero-carbon alternatives and are willing to pay for them. When you pay more for an electric car, a heat pump, or a plant-based burger, you're saying, "There's a market for this stuff. We'll buy it." If enough people send the same signal, companies will respond – quite quickly, in my experience. They'll put more money and time into making low-emissions products, which will drive down the prices of those products, which will help them get adopted in big numbers. It will make investors more confident about funding new companies that are making the breakthroughs that will help us get to zero. Without that demand signal, businesses won't develop any innovations because there's no economic incentive to make them.

Q: What is the main idea of the passage?

- ① Rewarding consumers for their green choice will encourage companies to develop green products.
- ② Buying green will help bring more products to market by creating certainty and reducing costs.
- ③ Green innovation has a positive effect on businesses' competitive advantages and sustainability.
- ④ Sustaining a delicate balance between supply and demand is essential for innovations in low-carbon technologies.

14. That the French love classifying things is apparent not only with regard to wine but also with regard to the classification of people by title and in their fastidiousness with politeness and attention to social norms. (A) One can quickly learn to resent the French attitudes of cultural superiority and their lack of immediate friendliness. (B) For example, when introductions are required, the person who makes an introduction must be of the same status as the person being introduced. (C) Also, in a business meeting, it is essential that the person with the highest rank occupies the middle seat. (D) The importance paid to social standing is so great that even salary takes second place.

Q: Which of the following should be deleted for the coherent flow of the passage?

- ① (A) ② (B)
- ③ (C) ④ (D)

[15-16] 다음 글을 읽고 물음에 답하시오.

It seems that these days everyone is allergic to something. A century ago, however, this was not the case. Allergies were rare – a disease of rich city folk who had the food, water, and medical care that money could buy. In cities of North America and Europe, allergies are now commonplace. Note, however, that allergies are still rare in developing countries. What is behind this? The cause can't be _____ in the following respect: Children born in the U.S. to recent immigrants from developing countries have the same rates of allergy as do children whose parents have lived here for generations. Clearly, there is something about living in an industrialized society that increases the risk of allergy. The observation that the increase in allergy is correlated with the decrease in childhood diseases has led to the advent of the hygiene hypothesis. The twentieth century saw remarkable advances in public health, particularly in industrialized countries. Children no longer contract the serious diseases of the past: smallpox, polio, diphtheria, measles, or cholera. Improvements in public sanitation and water supplies together with universal vaccination and judicious use of antibiotics have kept us living longer, healthier lives and have drastically reduced infant mortality in the industrialized world. The cost? Allergy.

15. Which of the following can be inferred from the passage?

- ① Allowing kids to get a little less sanitized early in life might prevent allergy later on.
- ② The link between immune disorders and chances of allergic diseases seems straightforward.
- ③ Higher incidence of infection in early childhood could be an explanation for the rise in allergic diseases.
- ④ The hygiene hypothesis can't explain why allergic cases sharply increased in a certain place.

16. What is the best expression for the blank?

- ① genetic
- ② medical
- ③ economic
- ④ environmental

[17-18] 다음 글을 읽고 물음에 답하시오.

Influenza is continuing its early and severe rampage through the United States, but there's some hopeful news for flu seasons of the future. In a significant step, researchers recently said they've been able to immunize animals against all 20 known influenza A and B virus strains, marking an important step toward the goal of a single vaccine against all types of the flu. Our current flu vaccines prime the body to protect against four strains: two influenza A strains and two B strains. The composition of these vaccines is changed each year in anticipation of which strains will make most people sick during the coming season. Certain strains are known to circulate among humans, but many more circulate in animals and scientists worry that these viruses could jump to humans – suddenly exposing us to viruses our immune systems have never seen.

That's where a universal flu vaccine would help. The idea is that these multivalent shots could prep the body to recognize these viruses, should any of them take off in humans, helping prevent severe illness and death. Several universal flu vaccines are in various stages of development and testing, including one at the National Institutes of Health (NIH). For the current study, the experimental shot was used only in mice and ferrets, and the results were reported last month in the journal *Science*. The researchers say they're working through the process of making the vaccine to human quality standards and aim to try it in people in 2023. They're hopeful that, if those tests succeed, the vaccine could protect people in the event of another pandemic strain of flu.

17. What is the best title for the passage?

- ① Influenza Still Poses Formidable Threat for Human Beings
- ② Why Our Immune Systems Become Less Effective against Flu
- ③ Researchers Make Important Progress toward a Universal Flu Vaccine
- ④ How Flu Viruses Change Quickly and Often Become Resistant to Medications

18. According to the passage, which of the following is true about universal flu vaccine?

- ① NIH is currently the only institute that is developing it.
- ② Its human trials have been suspended due to unexpected side effects.
- ③ It aims at preparing our body to protect against four existing strains of influenza.
- ④ Its experimental shot has been given only to two species of animals.

[19-20] 다음 글을 읽고 물음에 답하시오.

In 1809, a Cherokee man named Sequoyah began working on a writing system for his nation's language. As an adult, Sequoyah worked as a silversmith and blacksmith, and served with the U.S. Army in the Creek War of 1813-1814. As a result, he spent time with Americans, observing how they used writing to learn and share information. He was determined to give the Cherokee people the same advantage. At first, he attempted to create a pictographic system, in which each symbol represents a word, but realized this would require speakers to learn thousands of symbols.

After the war, he got married and settled in Alabama. There, he set out to finish his writing system. He worked so obsessively that he _____ his responsibilities at home and in the fields. His neighbors speculated that he was practicing witchcraft, and his wife grew so _____ that she burned some of his papers. But in 1821, he finished the creation of Cherokee syllabary, which is still used today. It was a monumental task, especially considering that he could not read or write in English or any other language. Within three to five years of its introduction, the tribe could read and write. As many as 90 percent of the Cherokee were literate by the 1830s, a far higher literacy rate than among the white settlers of America.

19. What are the best expressions for the blanks?

- ① evaded – proud
- ② fulfilled – dedicated
- ③ neglected – frustrated
- ④ recognized – disappointed

20. According to the passage, which of the following is true?

- ① The Cherokee writing system is a pictographic system.
- ② Sequoyah learned how to read and write English in the U.S. Army.
- ③ Sequoyah was illiterate in any language before inventing the writing system.
- ④ The Cherokee had a lower literacy rate than white Americans by the 1830s.

21. 함수 $f(x) = \lim_{n \rightarrow \infty} \left(1 + \frac{x}{n}\right)^{\frac{n}{2}}$ 에 대하여 $\ln(2f'(2))$ 의 값은?

- ① -1 ② 0 ③ 1 ④ 2

22. 곡선 $y^3 - 4y - 3x^3 + 4x - 1 = 0$ 위의 점 (1, 2)에서의 접선의 방정식이 $y = a(x - 1) + 2$ 일 때 a 의 값은?

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

23. 다음 중 수렴하는 급수는?

- ① $\sum_{n=2}^{\infty} \frac{(-1)^n}{\sqrt{n \ln n}}$ ② $\sum_{n=2}^{\infty} \frac{2^n}{n(\ln n)^2}$
- ③ $\sum_{n=1}^{\infty} \frac{n}{n^2 + 1}$ ④ $\sum_{n=1}^{\infty} \cos(2^{-n})$

24. 급수 $\sum_{n=1}^{\infty} \frac{1}{n} (1-x)^n$ 이 수렴하는 실수 x 의 범위는?

- ① $(-1, 1)$ ② $(-1, 1]$ ③ $(0, 2)$ ④ $(0, 2]$

25. 함수 $f(x) = xe^{2x}$ 을 $x=0$ 에서 테일러 전개하였을 때 x^3 의 계수는?

- ① 1 ② 2 ③ 4 ④ 8

26. 다음 중 $\ln(1.1)$ 과의 차가 0.001 이하인 것은?

- ① 0.093 ② 0.095 ③ 0.097 ④ 0.099

27. 정적분 $\int_0^{\frac{3}{2}} 15x\sqrt{2x+1} dx$ 의 값은?

- ① 26 ② 27 ③ 28 ④ 29

28. 두 곡선 $y = -\ln x$, $y = ex$ 및 x 축으로 둘러싸인 부분을 y 축으로 회전하여 얻은 입체의 부피는?
(단, e 는 자연로그의 밑이다.)

- ① $\left(\frac{1}{2} - \frac{5}{6e^2}\right)\pi$ ② $\left(\frac{5}{2} - \frac{1}{6e^2}\right)\pi$
 ③ $\left(\frac{1}{4} - \frac{5}{6e^2}\right)\pi$ ④ $\left(\frac{5}{4} - \frac{1}{6e^2}\right)\pi$

29. 이중적분 $\int_{-1}^1 \int_{-1}^x e^{y^2-2y-1} dy dx$ 의 값은?

- ① $\cosh(1)$ ② $\sinh(1)$
 ③ $\cosh(2)$ ④ $\sinh(2)$

30. 구면 $x^2 + y^2 + z^2 = 2$ 에서 $z \geq x^2 + y^2$ 인 곡면의 넓이는?

- ① $(3 - \sqrt{3})\pi$ ② $(4 - 2\sqrt{2})\pi$
 ③ $(5 - 2\sqrt{3})\pi$ ④ $(6 - 3\sqrt{2})\pi$

31. 영역 $D = \{(x, y) \mid (x-1)^2 + y^2 \leq 1\}$ 에 대하여 이중적분

$$\iint_D \frac{1}{\sqrt{x^2 + y^2}} dx dy$$

- 의 값은?
 ① $\sqrt{2}$ ② 2 ③ $2\sqrt{2}$ ④ 4

32. 함수 $f(x, y) = \sum_{k=1}^4 \left(x \cos \frac{k}{2}\pi + y - \sin \frac{k}{2}\pi \right)^2$ 의 최솟값이 $f(a, b)$ 일 때 $a+b$ 의 값은?

- ① -1 ② 0 ③ 1 ④ 2

33. 함수 $f(x, y) = x^2 + y \ln x$ 와 $a^2 + b^2 = 1$ 인 실수 a, b 에 대하여 $\lim_{h \rightarrow 0} \frac{f(1+ha, 2+hb) - 1}{h}$ 의 최솟값은?

- ① -4 ② -1 ③ 1 ④ 4

34. 함수 $f(x, y) = x^2 - 4xy + y^3 + 4y$ 의 안장점이 (a, b) 일 때 $a+b$ 의 값은?

- ① -6 ② -2 ③ 2 ④ 6

35. $xyz = 128$ 인 모든 양의 실수 x, y, z 에 대하여 $2\sqrt{x+y} + \frac{z^2}{2}$ 의 최솟값은?

- ① 10 ② 12 ③ 14 ④ 16

36. 다음 중 대칭행렬이면서 직교행렬인 것은?

- ① $\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 1 \\ 1 & -1 \end{pmatrix}$ ② $\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$
 ③ $\frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 1 \\ -1 & 1 \end{pmatrix}$ ④ $\frac{1}{\sqrt{2}} \begin{pmatrix} -1 & 1 \\ 1 & -1 \end{pmatrix}$

37. 다음 행렬 A 의 모든 고유값의 합은?

$$A = \begin{pmatrix} 6 & -1 & 5 \\ -8 & 4 & -10 \\ -5 & 1 & -4 \end{pmatrix}$$

- ① -10 ② -5 ③ 4 ④ 6

38. 선형사상 $T: \mathbb{R}^3 \rightarrow \mathbb{R}^2$ 가

$$T(1, 0, 1) = (2, 1), \quad T(1, 1, 2) = (-3, 2)$$

를 만족시킬 때 $T(1, -2, -1)$ 은?

- ① (-12, -1) ② (-12, 1)
 ③ (12, -1) ④ (12, 1)

39. 타원 $x^2 + xy + y^2 = 3$ 의 장축의 길이와 단축의 길이의 곱은?

- ① $2\sqrt{3}$ ② $4\sqrt{3}$ ③ $6\sqrt{3}$ ④ $8\sqrt{3}$

40. 미분방정식 $y'' + 4y' + 3y = 0, y(0) = 1, y'(0) = v$ 의 해 $y(x)$ 가 모든 양의 실수 x 에 대하여 $y(x) > 0$ 을 만족시키기 위한 v 의 최솟값은?

- ① -1 ② -2 ③ -3 ④ -4