

2025학년도 동국대학교 편입학모집 자연계열 필답고사 문제지

㉠형

출제문항 : 영어 20문항, 수학 20문항 - 90분

지원학과/전공	수험번호	성명

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- ◇ 답안지 여백에 개인 신상과 관련된 어떤 내용 또는 불필요한 표시를 하는 경우 답안지는 무효 처리됩니다.

<영어>

■ [1-2] Identify the **LEAST** acceptable expression underlined in each passage below.

1. The game of science ① is, in principle, without end. He who ② decides one day that scientific statements do not ③ call for any further test, and that they can ④ regard as finally verified, ⑤ retires from the game. [1점]

2. ① Under normal conditions the research scientist is ② not an innovator but a solver of puzzles, and the puzzles ③ which he concentrates are ④ just those which he believes ⑤ can be both stated and solved within the existing scientific tradition. [2점]

■ [3-4] Choose the answer that has the closest meaning to the word underlined in each sentence below.

3. Biomorphic regeneration is the restoration of lost body structures and tissues that are rebuilt through a mass of adjoining cells. [1점]

- ① abnormal
- ② contiguous
- ③ opposite
- ④ secular
- ⑤ temporal

4. Before the act was fully repealed in 1986, over 270 million acres, or about 10 percent of all US lands, had been conferred to private individuals by the federal government. [1점]

- ① abolished
- ② daunted
- ③ meddled
- ④ rehearsed
- ⑤ touted

■ [5-8] Complete each passage with the best expression.

5. (). Water is used again and again. It falls as rain. Then it goes one of three places. It might seep slowly through the soil as it soaks through into the natural reservoirs underground. It might disappear into the air by evaporating quickly. It might run off into streams to rivers to the oceans. [1 점]

- ① Water can be wasted if not managed properly
- ② The amount of water on Earth is increasing
- ③ Humans must invent better systems to drink water
- ④ Water's journey starts after it flows into the ocean
- ⑤ Nature has a perfect system for recycling water

6. Twice in this century, in 1929 and 1979, the international money market had no order. Everything seemed upset. The value of money changed from hour to hour. People began to look through their jewelry for unwanted pieces to sell. The price of gold was changing so fast that (). People were at a loss about the evolving situation. [1점]

- ① investors confidently predicted a recovery soon
- ② no one knew what would happen
- ③ there was a sense of stability amid fluctuations
- ④ the international markets recovered
- ⑤ there was no real crisis

7. The British-Canadian computer scientist often touted as a “godfather” of artificial intelligence has shortened the odds of AI wiping out humanity over the next three decades, warning the pace of change in the technology is “much faster” than expected. Prof Geoffrey Hinton, who this year was awarded the Nobel prize in physics for his work in AI, said there was a “10% to 20%” chance that () within the next three decades. Previously Hinton had said there was a 10% chance of the technology triggering a catastrophic outcome for humanity. [2점]

- ① AI would lead to human extinction
- ② AI would solve humanity's problems
- ③ advancements in AI would become stagnant
- ④ humanity would fully control AI
- ⑤ AI would create universal peace and harmony

8. Living in this city on the cutting edge, I have lately found myself in a game of chicken with cars driven by nothing but artificial intelligence. Waymo robot taxis, owned by the same company as Google, are everywhere in San Francisco — and they will soon be driving themselves in six U.S. cities. During rush hour each weekday, easily two or three dozen of the white SUVs, loaded up with cameras and spinning sensors, pass by a street near my house. I generally find riding in a Waymo to be smooth and relaxing, and I have long assumed its self-driving

technology is a net benefit for the city. ().
When I try to cross my street at a marked crosswalk, the Waymo robotaxis often wouldn't yield to me. I would step out into the white-striped pavement, look at the Waymo, wait to see whether it's going to stop -- and the car would zip right past. [2점]

- Ⓐ The Waymo system works perfectly
- Ⓑ Waymo's safety features are properly installed
- Ⓒ Waymo's technology has eliminated all issues with driving
- Ⓓ Then I started to notice something unsettling
- Ⓔ Waymo must be consistently respectful toward pedestrians

▣ [9-20] Read each passage below and answer the questions that follow.

For years, computer scientists have worried that advanced artificial intelligence might be difficult to control. A smart enough AI might pretend to comply with the constraints placed upon it by its human creators, only to reveal its dangerous capabilities at a later point. Until this month, these worries have been purely theoretical. Some academics have even dismissed them as science fiction. But a new paper, shared exclusively with TIME ahead of its publication on Wednesday, offers some of the first evidence that today's AIs are capable of this type of deceit. The paper, which describes experiments jointly carried out by the AI company Anthropic and the nonprofit Redwood Research, shows a version of Anthropic's model, Claude, strategically misleading its creators during the training process in order to avoid being modified. The findings suggest that it might be harder than scientists previously thought to "align" AI systems to human values, according to Evan Hubinger, a safety researcher at Anthropic who worked on the paper. "This implies that our existing training processes don't prevent models from pretending to be aligned," Hubinger tells TIME. Researchers also found evidence that suggests the capacity of AIs to deceive their human creators increases as they become more powerful. This would mean the more advanced an AI, the less confident computer scientists can be that their alignment techniques are effective. "Fundamentally, it's a problem for labs' ability to control their models," Hubinger says.

9. What recent evidence suggests that advanced AI systems might be capable of deceiving their creators? [2점]

- Ⓐ AI researchers have always known this capability exists and is to be valuable.
- Ⓑ Experiments showed an AI model misleads its creators during training.
- Ⓒ AI systems are incapable of deception, and this idea is purely theoretical.
- Ⓓ An AI only deceives researchers after its deployment in the real world.
- Ⓔ A recent study highlights AI's ability to learn human values during training.

10. What implication does the increase in AI's capacity for deception, as it becomes more advanced, have for researchers' ability to align AI with human values? [3점]

- Ⓐ It confirms that alignment techniques will be done away with alongside AI advancements.
- Ⓑ It indicates that less powerful AI systems are harder to align than advanced ones as they are deficient in capability.
- Ⓒ It suggests that alignment might become more challenging as AI systems grow more sophisticated.
- Ⓓ It demonstrates that AI alignment is no longer a significant concern for researchers.
- Ⓔ It reveals that current alignment methods may not need significant revision as AI progresses rapidly.

11. Which of the following is true of the existing training processes for AIs? [3점]

- Ⓐ They completely prevent models from pretending to align with human ethical and moral values.
- Ⓑ They ensure AI systems remain harmless regardless of their sophistication.
- Ⓒ They eliminate the need for ongoing research into AI alignment techniques.
- Ⓓ They may not be adequate to stop AI models from strategic deception during training.
- Ⓔ They obviate the need for entirely new paradigms in AI training and control procedures.

In 1896, Adolph Ochs purchased *The New York Times* and transformed it into the country's first serious newspaper. His slogan, "All the News That's Fit to Print," emphasized the *Times'* focus on serious journalism, differentiating the paper from the likes of William Randolph Hearst's *San Francisco Examiner*, whose yellow journalism, or more sensationalist ethos, dominated the press. The pinnacle of Hearst's yellow journalism was the headline, "Destruction of the War Ship Maine Was the Work of an Enemy!" referring to a sunk warship off the coast of Cuba. The unsubstantiated claim that Spain had buried a bomb in the U.S.S. Maine became the pretext for the Spanish-American War. The *Times'* emphasis on facts and evidence became the gold standard for 20th century American journalism and a cornerstone of American democracy. It wasn't until the emergence of social media, little more than a decade ago, that fake news came back with a vengeance. But today's disinformation ecosystem is different from the early days of yellow journalism. With more powerful and virulent tools, fake news can travel at near two thirds the speed of light, often without human regulation. Victims of disinformation can be sucked unwittingly into propaganda vortexes based on demographics and browsing histories. Trained artificial intelligence (AI) bots can invent infinite variations on lies. Fake news started wars in the late 19th century. Today, it sways elections. I watched an election hijacking unfold while living in Bogota, Colombia, where I was writing about the social unrest that exploded throughout Colombia during the pandemic. The turbulent 2021 Colombian protests lasted four months and set the stage for the 2022 election of a fringe party candidate and former guerrilla.

12. Which of the following was true of *The New York Times* under Adolph Ochs? [2점]

- Ⓐ It focused on serious journalism, emphasizing facts and evidence.
- Ⓑ It prioritized sensational headlines to attract readers.
- Ⓒ It relied on unsubstantiated claims like those in Hearst's papers.
- Ⓓ It advocated for war through its acclaimed editorials and coverage.
- Ⓔ It avoided covering significant news stories to maintain neutrality.

13. Which of the following can be inferred from the passage above? [2점]

- Ⓐ Social media has entirely eradicated the effects of yellow journalism.
- Ⓑ Social media is less influential than yellow journalism in shaping public opinion as it can be regulated by AI bots.
- Ⓒ Social media and yellow journalism share the same tools for spreading disinformation fast to the public.
- Ⓓ Social media relies exclusively on human regulation to control and preclude fake news.
- Ⓔ Social media accelerates the spread of disinformation much faster than traditional newspapers could.

14. Which of the following does the passage above imply? [3점]

- Ⓐ Fake news today has minimal impact compared to the past as they are controlled by powerful and effective AI tools.
- Ⓑ Disinformation is less harmful now due to advanced AI regulations.
- Ⓒ Fake news, fueled by AI and social media, can manipulate democratic processes and destabilize societies.
- Ⓓ Modern disinformation ecosystems cannot influence elections or societal decisions.
- Ⓔ The emergence of social media has decreased the relevance of traditional journalism standards to a minimum.

More than any other factor, high prices for consumer goods shifted the country to the right and delivered the presidency to Donald Trump. Yes, prices are not right for most Americans -- they are just too high. Paying for groceries has become a huge burden on the pocketbooks of working-class America, but Vice President Kamala Harris simply never put forward a clear and compelling message on the issue. Not only did she fail to explain how she would fight inflation, but she failed to articulate forcefully how Trump's policies would reignite it. How could the administration that presided over both a global post-pandemic price surge, and inflation's precipitous decline almost to the Federal Reserve-targeted 2 percent level, not use the slogan "We fight it, Trump will ignite it"? Now

that the election is over, we will see how Trump's planned tax cuts, deportation of immigrants, and attempts to diminish the independence of the Fed will affect interest rates and inflation. However, I think there is a more effective way to deal with the clear burden and anxiety that consumers feel when it comes to groceries, gasoline, drug prices, and other must-have consumer items — regardless of who they voted for. I am always bewildered to see gas stations no more than a block apart with substantial differences in the price of a gallon of gas. I regularly see signs in my neighborhood for gasoline at \$3.79, and right down the street another service station offering the same amount for \$3.09. For a 20 gallon fill up that is a \$12.00 difference each time, probably \$600 more over the course of a year. Yet I see little indication that the cheaper gas station has more business than the more expensive one, nor do I find that being a loyal buyer of cheaper gas has any negative impact on how my car runs. This is hard to explain. It cannot be argued that there is a lack of transparency on the relative prices: huge red neon signs make clear what the gasoline costs. This kind of transparency isn't always the case for other kinds of consumer goods. It is time for that to be remedied.

15. Which of the following does the author suggest about the administration's handling of inflation during its tenure? [2점]

- Ⓐ It failed to reduce inflation from the pandemic-era surge.
- Ⓑ It reduced inflation to the targeted 2% but did not communicate this achievement effectively.
- Ⓒ It raised inflation through attacking and igniting of the mismanaging Federal Reserve.
- Ⓓ It relied on slogans to address inflation concerns that American people care about most.
- Ⓔ It avoided tackling the impact of inflation on consumer goods.

16. How did high consumer goods prices affect the recent election outcome? [2점]

- Ⓐ They shifted the country to the right and contributed to Trump's victory.
- Ⓑ They directly benefited working-class voters.

- Ⓒ They were effectively addressed by Kamala Harris during her campaign.
- Ⓓ They did not play any significant role in the period leading up to the election.
- Ⓔ They primarily affected wealthier Americans.

17. How does the author highlight the inefficiencies in consumer behavior related to gasoline purchases?

[3점]

- Ⓐ By arguing that consumers consistently choose the cheapest gas stations in their neighborhoods.
- Ⓑ By suggesting that loyalty to cheaper gas stations damages car performance.
- Ⓒ By claiming that gas station price differences are due to fuel quality variations rather than gas station locations.
- Ⓓ By pointing out that expensive gas stations usually offer better service than cheap ones.
- Ⓔ By noting that price transparency in gasoline does not necessarily apply to other consumer goods.

After decades of debate, one of the largest ever studies on birth order suggests it does actually make a difference. The debate has raged for more than a century: does birth order help to shape personality, or are conscientious firstborns and creative youngest children flawed stereotypes based on flimsy evidence? After decades of contested claims, a handful of recent studies found there was little evidence for meaningful differences. But in a study published on Monday, psychologists have pushed back and claim there is an effect after all. In one of the largest studies ever conducted on birth order, family size and personality, Canadian researchers gathered data from more than 700,000 volunteers and found that on average, middle children scored higher than their siblings on traits seen as important for cooperation. Scores for the same traits were also higher in families with more children, suggesting that people may be more likely to develop a cooperative personality when they are raised as part of a bigger group. The effects are not large, but Michael Ashton and Kibeom Lee, psychology professors at Brock University in Ontario and the University of Calgary in Alberta respectively, believe they challenge the idea that birth order and the number of children raised together have no meaningful impact on personality. "The weight

of that evidence now indicates that personality trait levels do differ as a function of birth order and sibship size,” they write in Proceedings of the National Academy of Sciences.

18. Which of the following does the new study on birth order and personality suggest? [2점]

- Ⓐ Neither birth order nor family size has a far-reaching consequence on personality traits.
- Ⓑ The recent study proves that middle children are less cooperative than their siblings.
- Ⓒ Birth order and family size can have small but significant effects on personality.
- Ⓓ Firstborns are universally more creative than youngest children.
- Ⓔ The number of siblings has no bearing on personality development.

19. Which of the following can be inferred from the passage above? [2점]

- Ⓐ Larger families consistently produce more competitive and conflicting individuals.
- Ⓑ Birth order matters more than family size in shaping personality.
- Ⓒ Cooperation is negatively correlated with the number of siblings and parents.
- Ⓓ Family size has no measurable impact on personality traits.
- Ⓔ People raised in larger families may develop stronger cooperative traits.

20. Which of the following does the study in the passage above imply? [3점]

- Ⓐ It conclusively proves that birth order does not determine personality.
- Ⓑ It shows that previous studies claiming no effect of birth order and sibship size on personality trait levels were entirely accurate.
- Ⓒ It suggests that conscientious firstborns and creative youngest childrens are utterly invalid and unreliable stereotypes about birth order.
- Ⓓ It provides strong evidence that birth order and family size can influence personality traits like cooperation.
- Ⓔ It diminishes the role of empirical evidence in understanding personality development.

< 수학 >

*문제풀이는 문제사이의 여백을 이용할 것.

1. 함수 $f(x) = \lim_{n \rightarrow \infty} \frac{x^{2n} + 3\sin(\pi x)}{x^{2n+2} + \sin^{2n}(\pi x) + 1}$ 가
불연속인 점의 개수는? [2점]

- ① 1 ② 2 ③ 3 ④ 4 ⑤ 5

2. 극한값이

$$\lim_{x \rightarrow 1^+} \left(\frac{1}{x-1} - \frac{1}{\ln x} \right) = \alpha,$$

$$\lim_{x \rightarrow \infty} (1 + 2^x)^{\frac{1}{x}} = \beta,$$

$$\lim_{x \rightarrow 0^+} x^x = \gamma$$

일 때, $\alpha + \beta + \gamma$ 의 값은? [2점]

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

3. 곡선 $y = \frac{x^2}{2} + 1$ 위의 점과 점 $(0, 4)$ 사이의 거리의
최솟값은? [2점]

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

4. 행렬 $\begin{pmatrix} 1 & -1 & 0 & 0 & 1 \\ 2 & -2 & 2 & 0 & 0 \\ 0 & 2 & 0 & 1 & 3 \\ 0 & 1 & 1 & 0 & 1 \end{pmatrix}$ 의 계수(rank)는? [2점]

- ① 1 ② 2 ③ 3 ④ 4 ⑤ 5

5. 매개방정식

$$x = \cos 2t, y = \sin 2t, z = 1 \quad \left(0 \leq t \leq \frac{\pi}{4}\right)$$

으로 나타낸 곡선의 밀도함수가

$\delta(x, y, z) = xy^2z$ 일 때, 곡선의 질량은? [2점]

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

6. 함수

$$f(x) = \begin{cases} x^n \cos\left(\frac{1}{x^3}\right) & (x \neq 0) \\ 0 & (x = 0) \end{cases}$$

에 대하여 2계도함수 $f''(x)$ 가 실수 전체의 집합에서 존재하도록 하는 자연수 n 의 최솟값은? [3점]

- ① 2 ② 4 ③ 6 ④ 8 ⑤ 10

7. 매개방정식

$$x = t + 3e^t, y = e^{2t} + 2e^t - 3$$

으로 주어진 곡선과 x 축이 만나는 점에서 이 곡선에 그은 접선의 방정식을 $y = ax + b$ 라 하자. $a + b$ 의 값은? (단, a, b 는 상수이다.) [3점]

- ① -2 ② -1 ③ 0 ④ 1 ⑤ 2

8. 함수 $f(x)$ 가 양수의 집합에서 연속이고 모든 실수 t 에 대하여

$$\int_{1+t}^{e^{2t}+t} f(x-t)dx = 4e^{3t} \sin t$$

를 만족한다. $f'(e^\pi)$ 의 값은? [3점]

- ① $e^{-\pi/2}$ ② $2e^{-\pi/2}$ ③ $3e^{-\pi/2}$
④ $4e^{-\pi/2}$ ⑤ $5e^{-\pi/2}$

9. 곡면 $z = y^3 e^x$ 위의 점 $(0, 1, 1)$ 에서의 접평면과 점 $(2, 3, -2)$ 사이의 거리는? [3점]

- ① $\sqrt{11}$ ② $\sqrt{13}$ ③ $\sqrt{15}$ ④ $\sqrt{17}$ ⑤ $\sqrt{19}$

10. 원기둥 $x^2 + y^2 = 1$ 과 평면 $x - y + z = 2$ 의 교선인 타원 위에서 $f(x, y, z) = x^2 + y^2 + z^2$ 의 최댓값과 최솟값의 곱은? [3점]

- ① 17 ② 18 ③ 19 ④ 20 ⑤ 21

11. 행렬 A, B 가 $BA = A^2 + 3A^3$ 를 만족하고

$A^{-1} = \begin{pmatrix} -2 & -3 & 6 \\ 2 & 1 & 0 \\ -1 & -1 & 3 \end{pmatrix}$ 일 때, 행렬식 $\det(B)$ 의 값은?

[3점]

- ① 1 ② 2 ③ 3 ④ 4 ⑤ 5

12. $f(0) = 2$ 인 함수 $f(x)$ 가 $x > -1$ 인 모든 실수 x 에 대하여

$(x+1)^2 f'(x) = -2(x+1)f(x) + 3(x+1)^2$ 을 만족한다. $f(1)$ 의 값은? [3점]

- ① $\frac{1}{4}$ ② $\frac{3}{4}$ ③ $\frac{5}{4}$ ④ $\frac{7}{4}$ ⑤ $\frac{9}{4}$

13. 극한 $\lim_{n \rightarrow \infty} \frac{(1+2^2+3^2+\dots+n^2)^4}{n^2(1+2^4+3^4+\dots+n^4)^2}$ 의 값은?
[3점]

- ① $\frac{16}{25}$ ② $\frac{25}{64}$ ③ $\frac{49}{64}$ ④ $\frac{25}{81}$ ⑤ $\frac{25}{49}$

14. 함수 $f(x) = \int_0^{x^2} (x^2+t)\tan t dt$ 에 대하여
 $f'\left(\frac{\sqrt{\pi}}{2}\right)$ 의 값은? [3점]

- ① $\frac{\sqrt{\pi}}{2}(\pi + \ln 2)$ ② $\frac{\sqrt{\pi}}{2}(\pi + 2\ln 2)$
③ $\frac{\sqrt{\pi}}{2}(2\pi + \ln 2)$ ④ $\frac{\sqrt{\pi}}{2}(3\pi + \ln 2)$
⑤ $\frac{\sqrt{\pi}}{2}(3\pi + 2\ln 2)$

15. 함수 $f(x) = x^3 + x - 2$ 의 역함수를 $g(x)$ 라 할 때
 $\int_0^2 g(x-2)dx$ 의 값은? [3점]

- ① $\frac{5}{4}$ ② $\frac{7}{4}$ ③ $\frac{9}{4}$ ④ $\frac{11}{4}$ ⑤ $\frac{13}{4}$

16. 꼭짓점 $(0, 0)$, $(3, 0)$, $(0, 6)$ 인 삼각형의 선분 위를
원점을 출발하여 반시계 방향으로 움직여 원점으로 되
돌아오는 곡선 C 에 대하여
선적분 $\int_C xy dx + (xy^2 - e^{\cos y}) dy$ 의 값은? [4점]

- ① 34 ② 36 ③ 40 ④ 42 ⑤ 45

17. 극한 $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{2k}{n^2} \sin^{-1}\left(\frac{k}{n}\right)$ 의 값은? [4점]

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

18. $\int_0^1 \int_{\sqrt{4-x^2}}^{\sqrt{9-x^2}} 6xy \sqrt{x^2+y^2} dy dx$ 의 값은? [4점]

- ① 18 ② 19 ③ 20 ④ 21 ⑤ 22

19. 원뿔 $z = \sqrt{x^2 + y^2}$ 에서 $x^2 + y^2 \leq 2$ 인 곡면과 평면 $z = \sqrt{2}$ 위의 원판 $x^2 + y^2 \leq 2$ 으로 구성된 닫힌곡면을 Σ 라 하자.

벡터장 $\mathbf{F}(x, y, z) = x^2\mathbf{i} + y^2\mathbf{j} + z^2\mathbf{k}$ 에 대하여

$\iint_{\Sigma} \mathbf{F} \cdot \mathbf{N} d\sigma$ 의 값은?

(단, $\mathbf{N}$ 은 외향단위법선벡터이다.) [4점]

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

20. $A = \begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 2 & 1 \end{pmatrix}$, $b = \begin{pmatrix} 3 \\ 0 \\ 12 \end{pmatrix}$ 일 때, $Ax = b$ 의 최소제곱해는? [4점]

- ① $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$ ② $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ ③ $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$ ④ $\begin{pmatrix} 4 \\ 1 \end{pmatrix}$ ⑤ $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$