

2024학년도 건국대학교 편입학 필기고사

자 연 계

A형

- 시험 시간은 14:00 ~ 15:00 (60분)입니다.
- 이 문제지는 총 40문항으로 구성되어 있습니다. 문제지 하단의 쪽수(현재 쪽/전체 쪽)를 보시고 페이지 누락여부를 확인한 후, 누락된 페이지가 있으면 즉시 감독자에게 말씀하셔서 문제지를 교체하시기 바랍니다.
- 각 문항별로 배점이 상이하므로 유의하시기 바랍니다.
- 답안지에 **성명, 수험생 지원 모집단위, 수험번호, 문제 유형(A형/B형)**을 정확하게 기재 또는 표기 하십시오.
 - (1) OMR 답안지에 수험생이 직접 쓰는 ① **성명**, ② **지원모집단위**, ③ **수험번호**
 - 반드시 **흑색 볼펜 또는 컴퓨터용 사인펜**만 사용하여 기재 (연필, 샤프, 색깔 볼펜 등 사용 불가)
 - (2) OMR 답안지 상의 ① **수험번호 숫자 표기란**, ② **문제유형(A형/B형)**, ③ **답안 표기란**
 - 반드시 **컴퓨터용 사인펜**만 사용하여 표기
 - (3) 컴퓨터용 사인펜과 흑색 볼펜을 개인 지참하여 사용 가능
 - (4) 수정테이프(수정액 사용 불가)를 사용하여 답안 수정 가능
- 답안지 작성 시 **아래의 경우를 유의**하시기 바랍니다.
 - (1) 답안지 전체 0점 처리
 - 문제지 유형(A형/B형)을 표기하지 않은 경우
 - 인적사항을 알 수 없는 경우(수험번호와 성명을 동시에 미기재)
 - OMR 답안지에 표기하는 것 이외에 불필요한 표시 및 낙서를 하거나 답안과 무관한 서술을 기입한 경우
(예: 잘 부탁드립니다, 감사합니다, 수고하십시오 등)
 - 본인 신분을 나타낼 수 있는 표현 및 표시를 하는 경우
 - (2) 해당 문항 0점 처리
 - 컴퓨터용 사인펜 이외의 필기구로 답안을 표기하거나 바른 방법으로 표기하지 않아 전산에 인식되지 않은 경우
 - 답안을 중복하여 표기한 경우

※ 시험이 시작되기 전에는 표지를 넘기지 마십시오.



2024학년도 건국대학교 편입학 필기고사 문제지

자연계

편입구분	지원 모집단위	수험번호	성명
일반편입 / 학사편입			

※ [1-20번: 문항 당 2점 / 21-40번: 문항 당 3점]

[1-3] 밑줄 친 어휘와 의미가 가장 가까운 것을 고르시오.

1. During the first few months we lived in our house, we suffered one calamity after another; first the furnace exploded; then the washing machine stopped working; then the roof began to leak.

- ① disaster ② diameter ③ diagnosis
④ disease ⑤ difficulty

2. It was religion, not secular thought, that advanced the view that nature is founded on a deep rationality.

- ① worldly ② separate ③ guarded
④ awkward ⑤ profound

3. They lived in the dreary little town in the Midwest.

- ① peaceful and calm
② rural and pastoral
③ dull and depressing
④ warlike and fiery
⑤ cozy and comfortable

[4-8] 빈칸에 들어갈 가장 적절한 단어를 고르시오.

4. The doctor paid _____ attention to his patients; he made careful notes of even tiny changes in their illnesses.

- ① cool ② rare ③ passionate
④ meticulous ⑤ sincere

5. When an underwater object is seen from outside the water, its appearance becomes _____. This is because refraction changes the direction of the light rays that come from the object.

- ① disposed ② distorted ③ dismissed
④ distressed ⑤ discharged

6. When photography came along in the nineteenth century, painting was put in crisis. The photograph, it seemed, did the work of imitating nature better than the painter ever could. Some painters made _____ use of the invention. There were Impressionist painters who used a photograph in place of the model or landscape they were painting.

- ① imaginable ② pragmatic ③ illogical
④ moderate ⑤ independent

7.

A: You're not eating your spaghetti correctly.

B: I'm not?

A: You're supposed to put your spaghetti in the spoon and twirl it with the fork.

B: (laughs)

A: Why are you laughing?

B: Why do you want _____?

A: What do you mean?

B: I was born in Italy!

- ① to add insult to injury
② to have the right chemistry
③ to go home and kick the dog
④ to teach a fish how to swim
⑤ to mend the barn after the horse is stolen

8.

A: Have you seen Sue's new car?

B: Yeah. It looks good, but she's had nothing but problems with it.

A: That's too bad. It sounds like she got a real _____.

B: She sure did! No sooner did she drive it home from the dealer's than it proved defective and started breaking down.

- ① parasite ② bread ③ deal
④ duck ⑤ lemon

[9-10] 밑줄 친 (A)~(E) 중 어법상 적절하지 않은 것을 고르시오.

9. Laughter (A) resulting from humor shows (B) itself when people find themselves in an unfavorable situation, (C) for which they generally (D) would have felt anger and/or fear, and the detection of incongruent elements allows (E) themselves to watch it from a different perspective.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

10. We are often told that there is no innovation without competition, (A) what is absurd (B) given that most of the greatest innovations in science and technology (C) have resulted from the sharing of research (D) across academic silos, national borders, and language barriers. In truth, no great innovations (E) occur in isolation.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

[11-13] 빈칸에 들어갈 말로 가장 적절한 것을 고르시오.

11. If you cannot retrieve a fact or idea, stay with it until the memory appears. Don't give up assuming it's lost. When a memory doesn't surface the moment we want, the default response is to assume it is forgotten. You likely didn't forget. You just need to give the brain a moment to shuffle through the mental forest. The key is not to force the memory, but instead, to relax and let it come. If you are stuck for an extended period, try recalling anything. Then use the power of _____ to steer toward the information. For example, if you are struggling to recall the earlier chapters of a book, start with the middle or later chapters, or any part that comes easy.

- ① concentration ② association ③ continuation
- ④ internalization ⑤ reconciliation

12. It is well known that the ancient Greeks, Indians and Chinese produced vast bodies of sophisticated knowledge, ranging over mathematics, medicine, and astronomy. Indeed, much of this knowledge was appropriated and reworked by the Muslims and Christian scholars who are normally credited with having initiated the scientific project. So why then should we not also call these antique sages "scientists"? The simple but generally applicable answer is that their societies did not assign a specific social role to the scientist. What we would now recognize as _____ was always done in service of something else, not as an end in itself. That "something else" may be leisure or statecraft, each in its own way forcing science to operate within a rigid framework that allowed for considerable innovation but never autonomy.

- ① science ② knowledge ③ project
- ④ religion ⑤ creativity

13. The most disastrous activities of humans included hunting with firearms, ranching activities, and the building of beach resorts. There is little doubt that the Nene's near-extinction was hastened after shotguns were brought to Hawaii. It seems reasonable to assume that many more Nene were killed when guns became common. _____, as people moved further inland on the islands they began to open more and more land for the development of ranches and beach resorts. These developments forced the geese out of their natural nesting and breeding ranges. As these ranches and resorts became more and more plentiful, the Nene population accordingly decreased.

- ① As a result ② To recapitulate
- ③ On the other hand ④ In a similar fashion
- ⑤ In a notable contrast

14. 다음 글의 제목으로 가장 적절한 것은?

The devastation began on May 18, when an explosion, estimated at 500 times the force of the atomic bomb that destroyed the Hiroshima, ripped off the top 1,200 feet of the 9,700-foot volcano. In less than seven days, a cloud of volcanic gas containing some toxic chemicals and minute particles of radioactive substances spread over the nation. Scientists say that within several months the cloud—invisible to the naked eye in most regions—will cover the Northern Hemisphere in the stratosphere above 55,000 feet. It is expected to last about two years before completing its fall to earth. The environmental effects are considerable. The greatest economic impact is expected to be to the agriculture and timber industries in the country.

- ① Atomic Energy: Merits and Demerits
- ② Nuclear Umbrella: Causes and Effects
- ③ Exploding Volcano: Full Impact Yet To Come
- ④ Environmental Crisis: Some Novel Immense Disasters
- ⑤ Global Warming: Rationales and Immediate Consequence

[15-16] 다음 글을 읽고 물음에 답하시오.

A carbon sink is a natural feature that absorbs or stores more carbon than it releases. **(A)** The value of carbon sinks is that they can help create equilibrium in the atmosphere by removing excess CO₂. **(B)** One example of a carbon sink is a large forest. Its mass of plants and other organic material absorb and store tons of carbon. However, the planet's major carbon sink is its oceans.

Since the Industrial Revolution began in the eighteenth century, CO₂ released during industrial processes has greatly increased the proportion of carbon in the atmosphere. **(C)** Carbon sinks have been able to absorb about half of this excess CO₂, and the world's oceans have done the major part of that job. They absorb about one-fourth of humans' industrial carbon emissions, doing half the work of all Earth's carbon sinks combined.

Like kitchen sinks, the ocean sinks can fill up, though. The Southern Ocean, the strongest ocean sink, has taken in about 15 percent of the world's excess CO₂. **(D)** Clearly, the oceans do not have an infinite capacity to absorb carbon. **(E)** As their absorption capacity weakens, the buildup of CO₂ and other so-called greenhouse gases in the atmosphere increases, the result being a worldwide warming of the climate.

15. 위글의 제목으로 가장 적절한 것은?

- ① Oceans: Earth's Major Carbon Sink
- ② Increase of Greenhouse Gases
- ③ CO₂: The Cause of Climate Warming
- ④ Equilibrium: What Carbon Sinks Make
- ⑤ Overflow of The Southern Ocean

16. 글의 흐름상 다음 문장이 들어가기에 가장 적절한 곳은?

However, a multinational scientific survey completed in 2007 has shown that this ocean is reaching its carbon saturation point.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

[17-18] 다음 글을 읽고 물음에 답하시오.

Smart cities are definitely nudging the world toward some sustainability goals, and smart technologies are visibly improving city services within some fast-growing economies, most notably China. But (A) incrementally improving the management of electrical grids, pollution and waste, transportation, and city services can take the world only a short distance toward global sustainability. Smart city technologies do very little to alter and can even worsen problems such as wasteful consumption, feelings of alienation, income inequality, and inequality of services. The positive discourse of smart cities can also obscure the ways that the political and economic structures of cities themselves have (B) long been a cause of global environmental degradation.

Ecologist William Rees, who coined the term “ecological footprint,” reminds us of the complex ways that cities and the accompanying suburban sprawl draw down global resources and harm distant ecosystems. Urban economics, as he demonstrates, (C) tends to exaggerate the value of urbanization for sustainability by underestimating the global environmental damage from the rising consumption of city residents. Most cities rely on land, food, fresh water, natural resources, and energy far beyond their borders. And they rely on externalizing the cost of waste into distant lands, the global commons, and future generations. (D) Measured locally, the ecological footprint of the residents of a smart city may seem to be declining. But taking into account the shadows of consumption in faraway lands, this footprint looks very different, with deep social and environmental costs for (E) marginalizing peoples and fragile ecosystems.

17. 위글의 주제로 가장 적절한 것은?

- ① Causes of global environmental degradation
- ② Use of smart technologies for sustainable future
- ③ Environmental crises for residents of a smart city
- ④ Reduction of the cost of waste for future generations
- ⑤ Negative effects of smart cities on global sustainability

18. 밑줄 친 (A)~(E) 가운데 어법상 옳지 않은 것은?

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

[19-20] 다음 글을 읽고 물음에 답하시오.

Gypsies are a people scattered through many countries. The name Gypsy comes from the word ‘Egyptian’ because Gypsies were once thought to have come from Egypt. Some people now believe that they originally came from India. In the US Gypsies are called Roma, and in Britain they are known as Romanies or travellers. Roma or Romanies, like many other minority groups, have a strong sense of pride in their identity. Gypsies have always been associated with fortune-telling. They can be found at fairgrounds predicting people’s future by reading their palm or looking into a crystal ball. Because of the mystery associated with their origins and their magical powers, Gypsies have a popular romantic image that _____ the reality of families living on dirty caravan sites and being moved on by council officials or the police. Americans have little contact with Gypsies and think of the Roma only as exciting, mysterious people who wear brightly colored clothes and gold jewellery and have unusual powers.

19. 빈칸에 들어갈 말로 가장 적절한 것은?

- ① results from ② depends on ③ conflicts with
- ④ coincides with ⑤ accounts for

20. Gypsy에 대한 위글의 내용과 일치하는 것은?

- ① 고대 이집트에서부터 기원한 민족이다.
- ② 일정한 곳에 머무르지 않아 정체성 인식이 약하다.
- ③ 주술적 능력 때문에 대체로 두려운 존재로 여겨진다.
- ④ 미국인은 빈번한 접촉을 통해 그들을 흥미롭다고 생각한다.
- ⑤ 영국에서는 이들을 Romany 혹은 ‘여행자’라고 부른다.

※ [21-40번: 문항 당 3점]

21. 곡선 $y = (3x - 1)^{x^2 + 1}$ 의 $x = 1$ 에서의 접선의 기울기는?

- ① $2\ln 2 + 1$
- ② $4\ln 2 + 2$
- ③ $4\ln 2 + 6$
- ④ $8\ln 2 + 4$
- ⑤ $8\ln 2 + 12$

22. $\lim_{x \rightarrow 0^+} \frac{1}{\cos(x^2) - 1} \int_0^x x^2 \tan t \, dt$ 의 값은?

- ① -2
- ② -1
- ③ 0
- ④ 1
- ⑤ 2

23. $\int_0^2 \frac{4x + 8}{(x^2 + 4)^2} dx$ 의 값은?

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

24. $y = x^2$ 와 $y = x$ 로 둘러싸인 영역을 $y = x$ 를 축으로 회전하여 생기는 입체의 부피는?

- ① $\frac{\sqrt{2}}{90}\pi$
- ② $\frac{\sqrt{2}}{60}\pi$
- ③ $\frac{\sqrt{2}}{30}\pi$
- ④ $\frac{\sqrt{3}}{90}\pi$
- ⑤ $\frac{\sqrt{3}}{60}\pi$

25. 이상적분 $\int_0^1 x^2 \ln x \, dx$ 의 값은?

- ① $-\frac{1}{9}$
- ② $-\frac{1}{6}$
- ③ $-\frac{1}{2}$
- ④ -1
- ⑤ $-\frac{3}{2}$

26. 극곡선 $r = 1 + \sin\theta$ 의 $\theta = \pi/3$ 일 때의 접선을 l_1 , $\theta = 2\pi/3$ 일 때의 접선을 l_2 라 하자. 두 직선 l_1 , l_2 와 x 축으로 둘러싸인 삼각형 영역의 넓이는?

- ① $3 + 2\sqrt{3}$
- ② $\frac{3 + 2\sqrt{3}}{4}$
- ③ $\frac{26 + 15\sqrt{3}}{8}$
- ④ $\frac{26 + 15\sqrt{3}}{4}$
- ⑤ $\frac{26 + 15\sqrt{3}}{2}$

27. 극곡선 $r = 4 + 2\sin\theta$ 의 내부와 극곡선 $r = 4\sin\theta$ 의 외부에 놓인 영역의 넓이는?

- ① 10π
- ② 11π
- ③ 12π
- ④ 13π
- ⑤ 14π

28. 다음 급수 중 수렴하는 것을 모두 고르면?

(a) $\sum_{n=1}^{\infty} \frac{\sqrt[n]{n}}{n}$

(b) $\sum_{n=2}^{\infty} \frac{1}{n^{\sqrt{2}} \ln n}$

(c) $\sum_{n=1}^{\infty} \tan\left(\frac{1}{n}\right)$

- ① (a)
- ② (b)
- ③ (c)
- ④ (a), (b)
- ⑤ (a), (b), (c)

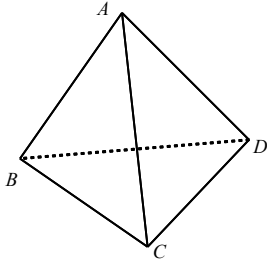
29. 급수 $\sum_{n=2}^{\infty} \frac{(\ln 7)^n}{n!}$ 의 합은?

- ① $6 - \ln 7$
- ② 6
- ③ $7 - \ln 7$
- ④ 7
- ⑤ $7 + \ln 7$

30. $f(x) = \frac{4}{7}x\sqrt{4+2x^2}$ 일 때 $f^{(7)}(0)$ 의 값은?

- ① 0
- ② 18
- ③ 27
- ④ 36
- ⑤ 45

31. 모서리의 길이가 1인 정사면체 $ABCD$ 가 있다.
다음 중 벡터 $\overrightarrow{AB} \times (\overrightarrow{AC} \times \overrightarrow{AD})$ 와 같은 벡터는?



- ① $\frac{1}{3}\overrightarrow{BC}$
- ② $\frac{1}{3}\overrightarrow{CD}$
- ③ $\frac{1}{2}\overrightarrow{CD}$
- ④ $\frac{1}{2}\overrightarrow{DC}$
- ⑤ $\frac{1}{2}\overrightarrow{DB}$

32. 곡면 $z = x^2 + y^2 + 4$, $x \geq 0$, $1 \leq x^2 + y^2 \leq 3$ 의 넓이는?

- ① $\frac{\pi}{12}(13\sqrt{13} - 5\sqrt{5})$
- ② $\frac{\pi}{12}(17\sqrt{17} - 13\sqrt{13})$
- ③ $\frac{\pi}{6}(13\sqrt{13} - 5\sqrt{5})$
- ④ $\frac{\pi}{6}(17\sqrt{17} - 13\sqrt{13})$
- ⑤ $\frac{\pi}{6}(17\sqrt{17} - 5\sqrt{5})$

33. 곡면 $2x^2 + 2y^2 + 3z^2 = 6$ 에서 함수 $f(x, y, z) = 4xy + 6z$ 의 최댓값은?

- ① 5
- ② 6
- ③ $6\sqrt{2}$
- ④ $6\sqrt{3}$
- ⑤ 9

34. 함수 $f(x, y) = x^4 + y^4 - 2xy$ 에 대한 다음 설명 중 옳은 것을 모두 고르면?

- (a) $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ 에서 f 는 극솟값을 갖는다.
- (b) $\left(-\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$ 에서 f 는 극댓값을 갖는다.
- (c) $(0, 0)$ 에서 f 는 극솟값을 갖는다.

- ① (a)
- ② (b)
- ③ (c)
- ④ (a), (b)
- ⑤ (a), (c)

35. R 는 $y = x^2$ 와 $y = \frac{x^2}{2} + \frac{1}{2}$ 로 둘러싸인 영역이다.

$\iint_R (x - y) dA$ 의 값은?

- ① $-\frac{4}{5}$
- ② $-\frac{4}{15}$
- ③ $\frac{4}{5}$
- ④ $\frac{4}{15}$
- ⑤ $\frac{2}{3}$

36. R 는 $(1,1), (2,0), (4,0), (2,2)$ 를 꼭짓점으로 하는 사각형 영역이다.

$\iint_R e^{\frac{y-x}{y+x}} dA$ 의 값은?

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

37. 매개변수방정식 $x=u+v, y=3u^2, z=u-v$ 로 주어진 곡면의 점 $(2,3,0)$ 에서의 접평면이 α 일 때 원점에서 평면 α 에 이르는 거리는?

- ① $\frac{3}{\sqrt{19}}$
- ② $\frac{5}{\sqrt{19}}$
- ③ $\frac{3}{\sqrt{17}}$
- ④ $\frac{7}{\sqrt{17}}$
- ⑤ $\frac{7}{\sqrt{15}}$

38. $f(t) = \int_0^t \int_{\sqrt{y}}^{\sqrt{t}} e^{x^2} dx dy$ 일 때, 미분계수 $f'(4)$ 의 값은?

- ① 1
- ② e
- ③ e^2
- ④ e^3
- ⑤ e^4

39. C 는 $x=2\cos t, y=3\sin t, 0 \leq t \leq \pi$ 로 주어진 곡선이다. 다음 선적분의 값은?

$$\int_C \frac{-y}{x^2+y^2} dx + \frac{x}{x^2+y^2} dy$$

- ① 0
- ② $\frac{\pi}{4}$
- ③ $\frac{\pi}{3}$
- ④ $\frac{\pi}{2}$
- ⑤ π

40. S 는 곡면 $x^2+y^2+z^2=1, x+y+z \geq 1$ 이다.

$\mathbf{F}(x,y,z) = (z+1, 0, x+y)$ 일 때 $\left| \iint_S \mathbf{F} \cdot d\mathbf{S} \right|$ 의 값은?

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

※ 시험이 시작되기 전에는 표지를 넘기지 마십시오.