

2022학년도 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 마킹하지 않은 경우
 - 인적사항을 알 수 없는 경우(수험번호와 성명을 동시에 미기재)
 - OMR 답안지에 마킹하는 것 이외에 불필요한 표시 및 낙서를 하거나 답안과 무관한 서술을 기입한 경우
(예시) 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 마킹하여 전산에 인식되지 않은 경우
 - 답안을 중복하여 마킹한 경우

※ 시험이 시작되기 전에는 표지를 넘기지 마십시오.



2022학년도 건국대학교 편입학 필기고사 문제지

자연계

편입구분	지원 모집단위	수험번호	성명
일반편입 / 학사편입			

※ [1-20번: 문항 당 2점]

[1-2] 밑줄 친 어휘와 의미가 가장 가까운 것을 고르시오.

1. Even though my son lives in Spain now, I have a sort of sixth sense when he's in trouble. My daughter thinks my prescience is only my imagination, but time after time I've been right about my son's safety matters.

- ① apprehension ② sentiment ③ resentment
④ foresight ⑤ involvement

2. The terms of your insurance policy that you have purchased last September clearly state that any false information in your application invalidates the policy. We recently made a decision that the medical history you provided us was not accurate. Accordingly, with this email, we inform you that, as of Dec. 21, 2020, your policy is cancelled.

- ① diminishes ② upgrades ③ prolongs
④ distorts ⑤ repeals

[3-4] 빈 칸에 들어갈 말로 가장 적절한 것을 고르시오.

3. Because scientific assessments of whether or not global warming is occurring have been _____, it has been difficult to convince the public that this phenomenon is a critical problem that needs to be addressed.

- ① substantial ② indisputable ③ inconclusive
④ plausible ⑤ tranquil

4. If you describe someone as _____, you mean they behave in a silly or light-hearted way, rather than being serious and sensible.

- ① modest ② insolent ③ frivolous
④ boorish ⑤ dexterous

[5-8] 밑줄 친 (A)~(E) 중 어법상 적절하지 않은 것을 고르시오.

5. The instinct of curiosity greatly contributes to humans' individual and collective progress. It urges people to seek the (A) unknown and to find answers to things not yet (B) understood. Thus, in more serious fields, it drives humans to explore and to conquer new frontiers in all dimensions. For example, (C) sparkling objects in the night sky have fascinated the human instinct of curiosity to the point (D) that humans have found a way to land on the moon and (E) reached beyond it.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

6. Gemstones are minerals (A) that occur naturally. The value of a gemstone is measured in various ways. It is measured by the stone's color, clearness, size, and how well the stone (B) has been cut. A jeweler cuts a stone to bring out its beauty. A gemstone sparkles because it is cut to have (C) angled sides, or facets. The facets reflect the light that (D) enter into the stone, (E) causing it to sparkle.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

7. Anecdotal evidence of a looming crisis in biodiversity is now (A) being reinforced by science. In their comprehensive surveys of plants, butterflies and birds over the past 20 to 40 years in Britain, ecologists found significant population (B) declines in a third of all native species. The problem would be bad enough if it (C) were merely local, but it's not; because Britain's temperate ecology is similar to (D) those in so many other parts of the world, it's the best microcosm scientists (E) have been able to study in detail.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

8. When the necessary amount of an element in an organism is extremely small, it (A) is called a trace element. Iodine is a trace element vital to the (B) functioning of the thyroid gland, which regulates the rate of the body's chemical activity, or metabolism. A slight iodine deficiency may (C) result in a huge swelling on the neck in the region of the gland, a condition (D) known as simpler goiter. Complete absence of iodine is fatal. Yet the total amount of iodine in a man's body is only about 1/2,500,000 of the entire body weight. As is the case with all minerals, iodine (E) must supply to the body in the diet.

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

[9-15] 빈 칸에 들어갈 말로 가장 적절한 것을 고르시오.

9. When are the people going to realize that women are a _____ source of our national defense? Canadian law has been revised, and now women are allowed to serve in all military positions in the Canadian armed forces.

- ① viable ② representative ③ distinctive
④ superficial ⑤ presumptuous

10. Lately John's been more conscientious about the accuracy and quality of his work with the company. He was warned that his job was _____ because of his lack of concern for his duties. When John was alerted that he was in danger of losing his job, he began to take his obligations with the company more seriously.

- ① in stitches ② out of the woods
- ③ on his last legs ④ in the hole
- ⑤ on the line

11. Etymology, the study of words and word roots, may sound like the kind of thing done by boring librarians in small, dusty rooms. Yet etymologists actually have a uniquely interesting job. They are in many ways just like _____ digging up the physical history of people and events. The special aspect of etymology is that it digs up history, so to speak, through the words and phrases that are left behind.

- ① meteorologists ② linguists ③ physicists
- ④ archeologists ⑤ psychologists

12. The technology of the North American colonies did not differ strikingly from that of Europe, but in one respect, the colonists enjoyed a great advantage. Especially by comparison with Britain, Americans had a wonderfully plentiful supply of wood. The first colonists did not find an entire continent covered by a climax forest. Even along the Atlantic seaboard, the forest was broken at many points. Nevertheless, there was an abundant supply of fine trees of all types, and through the early colonial period, those who pushed westward encountered new forests. By the end of the colonial era, the price of wood had risen slightly in eastern cities, but wood was _____.

- ① still readily available
- ② not very easy to find
- ③ considered too expensive
- ④ exported to other continents
- ⑤ different in types from western cities

13. Until the 19th century, when steamships and transcontinental trains made long-distance travel possible for large numbers of people, only a few adventurers, mainly sailors and traders, ever traveled out of their own countries. "Abroad" was a truly foreign place about which the vast majority of people knew very little indeed. Early map makers therefore had little fear of being accused of mistakes, even though they were often wildly inaccurate. When they compiled maps, imagination was as important as geographic reality. Nowhere is this more _____ than in old maps illustrated with mythical creatures and strange humans.

- ① important ② horrifying ③ unanticipated
- ④ evident ⑤ impeccable

14. A special feature of the real estate rental market is its tendency to undergo a prolonged contraction phase, more so than with manufactured products. When the supply of a manufactured product exceeds the demand, the manufacturer cuts back on output, and the merchant reduces inventory to balance supply and demand. However, property owners cannot reduce the amount of space available for rent in their buildings. Space that was constructed to accommodate business and consumer needs at the peak of the cycle _____, so vacancy rates climb and the downward trend becomes more severe.

- ① decreases ② remains ③ suspends
- ④ inflates ⑤ returns

15. What traditional entertainment always promised was to transport us from our daily problems, to enable us to escape from the struggles of life. Analyzing the mechanism through which this was achieved, literary scholar Michael Wood in his book *America in the Movies* described our films as a "rearrangement of our problems into shapes which tame them, which disperse them to the margins of our attention," where we can forget about them. This is what we really mean when we call entertainment "escapist": We escape from life by escaping into the neat narrative formulas in which most entertainments are packaged. Still, with movies there was always the assumption that the escape was _____. At the end of the film one had to leave the theater and reenter the maelstrom of real life.

*maelstrom: 대혼란, 큰 동요

- ① fundamental ② perpetual ③ temporary
- ④ unusual ⑤ tragic

[16-17] 다음 글을 읽고 물음에 답하시오.

The moon is the only world beyond the Earth whose landscape is laid out for view with the naked eye. If your eyesight is normal, you can make out a great many features on the moon's face—plains, mountainous regions, and the marks of meteorite impacts. The most obvious markings are dark gray patches. These are flat plains of lava, but 17th century astronomers using the newly invented telescope assumed they were water. They named each spot as if it were a sea, *mare* in Latin. *Mare Tranquillitatis*, the Sea of Tranquility, is the largest and famous as the site where Neil Armstrong first set foot in 1969. To its upper left is *Mare Serenitatis*, the Sea of Serenity, and *Mare Imbrium*, the Sea of Rains. All three are roughly circular, the result of lava's flooding gigantic craters left by meteorite impacts when the moon was young. To their left is the larger, more formless *Oceanus Procellarum*, the Ocean of Storms, with *Mare Humorum* (Sea of Moisture) and *Mare Nubium* (Sea of Clouds) below it. The large bright areas are mountainous, cratered terrain made of lighter colored rock. Tiny bright patches in *Oceanus Procellarum* are splashes of bright-colored rock kicked up by the formation of individual craters.

16. 위 글의 주제로 가장 적절한 것은?

- ① Spot in the Moon where humans first set foot
- ② History of observing the Moon with telescope
- ③ What we can see in the Moon with naked eyes
- ④ Why there are many seas and craters in the Moon
- ⑤ Origin of the Latin names of regions in the Moon

17. 위 글의 내용과 일치하지 않는 것은?

- ① 닐 암스트롱이 처음 착륙했던 곳은 평평한 용암 지대이다.
- ② 어두운 회색빛 조각들처럼 보이는 곳은 물이 흘렀던 흔적이다.
- ③ Mare Imbrium은 용암이 거대한 분화구 위로 범람하여 생겨났다.
- ④ 달 표면의 평야와 운석의 흔적들이 육안으로도 관찰 가능하다.
- ⑤ 달의 산악지역은 상대적으로 밝은 색의 바위들로 이루어져 있다.

18. (A), (B), (C)에 들어갈 말로 가장 적절한 것은?

Beginner drivers of all ages lack both driving skills and experience in recognizing potential dangers. For newly-licensed teenage drivers, their immaturity and limited driving experience result in (A) proportionately/disproportionately high rates of crashes. Graduated driver licensing systems address the high risks faced by new drivers by requiring an apprenticeship of planned and supervised practice—the learner's permit stage. This is then followed by a (B) provisional/permanent licence that places temporary restrictions on unsupervised driving. Commonly imposed restrictions include limits on night-time driving, limits on the number of passengers, and a prohibition against driving after drinking any alcohol. These (C) guidelines/restrictions are lifted as new drivers gain experience and teenage drivers mature, gaining a full licence. Although the specific requirements for advancing through these three stages vary by country, they provide a protective environment while new drivers become more experienced.

- | | (A) | | (B) | | (C) |
|---|--------------------|---|-------------|---|--------------|
| ① | proportionately | — | provisional | — | guidelines |
| ② | proportionately | — | provisional | — | restrictions |
| ③ | proportionately | — | permanent | — | guidelines |
| ④ | disproportionately | — | provisional | — | restrictions |
| ⑤ | disproportionately | — | permanent | — | guidelines |

[19-20] 다음 글을 읽고 물음에 답하시오.

(A) Although subtle, the effect of positive emotions is reliable and has been tested and supported in research laboratories, using a wide range of methods. Studies of memory, attention, and verbal fluency show that, under the influence of positive emotions, people have access to a wider array of information than (B) is typically accessible to them. Eye-tracking studies show that positive emotions literally expand one's peripheral vision, allowing people to see (C) more their surroundings. Brain imaging studies _____. Stroke patients with visual neglect, for instance, show expanded visual awareness when listening to pleasant music, (D) relative to unpleasant or no music, an effect apparently mediated by functional coupling of emotional and attentional brain regions. Likewise, brain-based measures of breadth of visual encoding indicate that induced emotions (E) bias early visual inputs, with positive emotions increasing and negative emotions decreasing the field of view.

19. 밑줄 친 (A)~(E) 중 어법상 적절하지 않은 것은?

- ① (A) ② (B) ③ (C) ④ (D) ⑤ (E)

20. 문맥상 빈 칸에 들어갈 말로 가장 적절한 것은?

- ① differ ② matter ③ concur ④ evolve ⑤ prosper

※ [21-40번: 문항 당 3점]

21. 좌표평면의 원점에서 두 점 A 와 B 가 출발하여 각각 x 축과 y 축을 따라 움직인다. t 초 후의 두 점 A, B 의 위치가 각각 $(10t - t^2, 0)$ 과 $(0, 6t - t^2)$ 이다. $0 \leq t \leq 7$ 인 범위에서 두 점 사이의 거리가 최대가 되는 t 의 값은?

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

22. 곡선 $y = (2x + 1)^x$ 위의 점 $(1, 3)$ 에서의 접선의 기울기는?

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

23. 곡선 $y = \frac{\ln x}{x}$ ($x > 0$)와 직선 $x = e$, 직선 $y = 0$ 으로 둘러싸인 영역을 직선 $x = -3$ 을 축으로 회전하여 만들어진 입체의 부피는?

- ① $4\pi - e$
- ② 4π
- ③ $4\pi + e$
- ④ 5π
- ⑤ $5\pi + e$

24. 직선 $y = x$ 와 포물선 $y = x^2$ 에 의하여 둘러싸인 영역을 직선 $y = x$ 를 축으로 회전하여 만들어진 입체의 부피는?

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

25. 위치벡터가

$$\mathbf{r}(t) = (2 \cos t + \cos(10t), 2 \sin t + \sin(10t))$$

인 물체의 속력이 최소가 되는 t 의 값은?

- ① $\frac{\pi}{9}$
- ② $\frac{\pi}{8}$
- ③ $\frac{\pi}{7}$
- ④ $\frac{\pi}{6}$
- ⑤ $\frac{\pi}{5}$

26. 극곡선 $r = \sqrt{2\cos\theta + 3}$ 의 외부 영역과 원 $r = 2$ 의 내부 영역의 공통부분의 넓이는?

- ① $\frac{2}{3}\pi - \sqrt{3}$
- ② $\frac{4}{3}\pi - \sqrt{3}$
- ③ $\frac{2}{3}\pi + \sqrt{3}$
- ④ $\frac{4}{3}\pi + \sqrt{3}$
- ⑤ 6π

27. 다음 매개곡선에 대하여 $t = \frac{\pi}{3}$ 에서 $\frac{d^2y}{dx^2}$ 의 값은?

$$\begin{cases} x = t - 3\sin t \\ y = 3 - 2\cos t \end{cases}$$

- ① $-15\sqrt{3} - 26$
- ② -40
- ③ 0
- ④ 40
- ⑤ $15\sqrt{3} - 26$

28. 다음 급수 중 수렴하는 것을 모두 고르면?

- (a) $\sum_{n=1}^{\infty} \frac{\ln n}{n}$

(b) $\sum_{n=1}^{\infty} \frac{1}{n} \sin\left(\frac{1}{n}\right)$

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

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

29. 급수 $\sum_{n=0}^{\infty} \frac{3^n}{4^n (2n)!}$ 의 합은?

- ① $\cos\left(\frac{\sqrt{3}}{2}\right)$
- ② $\sin\left(\frac{\sqrt{3}}{2}\right)$
- ③ $\frac{e^{\frac{\sqrt{3}}{2}} - e^{-\frac{\sqrt{3}}{2}}}{4}$
- ④ $\frac{e^{\frac{\sqrt{3}}{2}} + e^{-\frac{\sqrt{3}}{2}}}{4}$
- ⑤ $\frac{e^{\frac{\sqrt{3}}{2}} + e^{-\frac{\sqrt{3}}{2}}}{2}$

30. $f(x) = 2x^2\sqrt{3+x^2}$ 일 때 $f^{(6)}(0)$ 의 값은?

- ① $-20\sqrt{3}$
- ② $-15\sqrt{3}$
- ③ $5\sqrt{3}$
- ④ $15\sqrt{3}$
- ⑤ $20\sqrt{3}$

31. 점 $A(1, 2, 2)$, $B(3, 2, 3)$, $C(4, 1, 0)$, $D(2, 3, 0)$ 를 꼭짓점으로 하는 사면체 $ABCD$ 를 xy -평면으로 정사영하여 얻은 도형의 넓이는?

- ① 1
- ② 2
- ③ 3
- ④ 4
- ⑤ 5

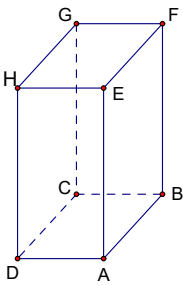
32. 점 A 는 평면 $x + y = 1$ 과 평면 $z = 0$ 의 교선 위에서 움직이고, 점 B 는 평면 $x = 1$ 과 평면 $z = 1$ 의 교선 위에서 움직인다. 삼각형 OAB 의 넓이의 최솟값은? (단, O 는 원점)

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

33. 원통의 밑면의 반지름은 $3cm/sec$ 의 일정한 속도로 증가하고 높이는 $4cm/sec$ 의 일정한 속도로 감소하고 있다. 반지름과 높이가 $10cm$ 로 같게 되는 순간의 원통의 부피의 변화율은?

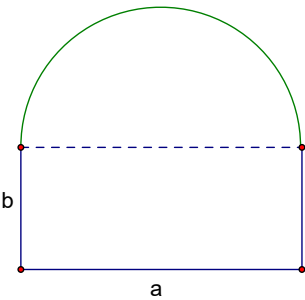
- ① $100\pi cm^3/sec$
- ② $200\pi cm^3/sec$
- ③ $300\pi cm^3/sec$
- ④ $400\pi cm^3/sec$
- ⑤ $500\pi cm^3/sec$

34. 그림과 같이 $\overline{AB}=1$, $\overline{AD}=1$, $\overline{AE}=2$ 인 직육면체 $ABCDEFGH$ 가 있다. 점 B , D , G 를 지나는 평면을 α 라 하고, 점 C 와 E 에서 평면 α 에 내린 수선의 발을 각각 X 와 Y 라 하자. 선분 XY 의 길이는?



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

35. 그림과 같이 직사각형 위에 반원을 올려놓은 형태의 도형이 있으며, 이 도형의 둘레의 길이가 l 로 일정하다. 이 도형의 넓이가 최대가 될 때 직사각형의 가로 a 와 세로 b 의 비 $\frac{a}{b}$ 의 값은?



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

36. 다음 반복적분의 값은?

$$\int_{\pi}^{2\pi} \int_{\frac{1}{x}}^1 y \sin(xy) dy dx$$

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

37. 벡터장 $\mathbf{F}(x, y) = \frac{-y}{(x^2 + y^2)^k} \mathbf{i} + \frac{x}{(x^2 + y^2)^k} \mathbf{j}$ 이고, 곡선 C 는 중심이 $(2, 0)$ 이고 반지름이 1인 원이다. 선적분 $\int_C \mathbf{F} \cdot d\mathbf{r} = 0$ 일 때 k 의 값은?

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

38. 곡선 C 가 $\mathbf{r}(t) = (\sin t, t)$, $0 \leq t \leq \frac{\pi}{2}$ 로 주어졌을 때 선적분

$$\int_C (4y^2 + e^x) dx + (8xy + \cos y) dy$$
의 값은?

- ① $\pi - e$
② $\pi + e$
③ $2\pi - e$
④ $2\pi + e$
⑤ $\pi^2 + e$

39. 벡터장 $\mathbf{F}(x, y, z) = (1, 1, 1)$ 과 반구면 $S: x^2 + y^2 + z^2 = 1, z \geq 0$ 에 대하여 면적분 $\iint_S \mathbf{F} \cdot d\mathbf{S}$ 의 절댓값은?

- ① 1
② π
③ 4
④ $\frac{3}{2}\pi$
⑤ 9

40. 벡터장 $\mathbf{F}(x, y, z) = (xz + e^y, x^2 + yz^2, z + e^x)$ 이고 S 는 구면 $x^2 + y^2 + z^2 = 1$ 일 때 면적분 $\iint_S \mathbf{F} \cdot d\mathbf{S}$ 의 절댓값은?

- ① $\frac{4\pi}{15}$
② $\frac{8\pi}{5}$
③ $\frac{8\pi}{3}$
④ 3π
⑤ 4π

※ 시험이 시작되기 전에는 표지를 넘기지 마십시오.