

단국대학교 2020학년도 편입생 모집 필기고사

자연계열 문제지
(A형)



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영어 [자연계열] ㉠ 형

※ 밑줄 친 부분과 뜻이 가장 가까운 것을 고르시오. (1-8) [각3점]

1. The soldier was treated with disdain by his comrades because he fled the battle after the first shot was fired.
① respect ② scorn ③ ambivalence ④ authority
2. As an iconoclast, Ashley delighted in disputing sacrosanct beliefs, questioning established authorities, and challenging long-held practices.
① mediator ② sycophant ③ nonconformist ④ beneficiary
3. Some police officers forget to read the Miranda rights to a criminal during an arrest, confuse their undercover identities, and even get fired from their jobs for their inept work.
① clumsy ② auspicious ③ recluse ④ merciless
4. When the right time comes, he reenters the conversation with a wise epigram, an illuminating story, or a trenchant argument.
① popular ② hot ③ incisive ④ effective
5. The two treaties that buttress the world's post-Cold War security architecture—setting strict limits and enforcing transparency on both the U.S. and Russian arsenals—will soon be terminated.
① support ② envision ③ design ④ build
6. Some Democrats worry that Trump's skill at tapping voters' latent misogyny would make it a mistake to nominate another woman.
① initial ② potent ③ evident ④ hidden
7. Stuck in the classroom, he gazes wistfully through the window at the boys playing soccer outside.
① wantonly ② yearningly ③ dreadfully ④ pleasantly

8. As a public speaker, Mark was extremely circumspect; he always took great care not to say the wrong thing or give offense.

- ① exact ② cautious ③ demanding ④ ambiguous

※ 어법상 빈칸에 가장 적절한 것을 고르시오. (9-11) [각3점]

9. Because Roman farmers had an ample supply of cattle, cattle _____ as a measure of wealth.

- ① was used ② is used
③ are used ④ were used

10. Women’s roles have always been more tightly _____ than men’s to parenthood, more limited by conceptions of reproduction.

- ① to bind ② binding
③ bound ④ bind

11. He, who was a member of the National Assembly before _____ governor in June last year, has been busy attracting domestic and foreign investment to upgrade the province’s industries.

- ① been elected ② electing as
③ having elected as ④ being elected

※ 밑줄 친 부분 중 어법에 맞지 않은 것을 고르시오. (12-14) [각3점]

12. The middle class expanded, the standards of living and of literacy ①rose, the size of families ②shrank; a new class of literate, idle women developed, on whose submission to ③enforced domesticity the evolving system of industrial capitalism ④depending.

13. We are proud of our “Diversity” program ①which artists visit French schools ② through the year to provide opportunities ③for shared experiences as well as ④expert personal insight to their craft.

14. He accused me ①of being sneaky, ②which I am not. Actually, I am not ③used to act in ④a deceitful manner.

※ 다음 글을 읽고 물음에 답하시오. (20-21) [각3점]

Studies show the importance of eye-to-eye contact, for instance, in real-life relationships, and indicate that the nature of one’s eye-contact patterns, whether one looks another squarely in the eye or looks to the side or shifts one’s gaze from side to side, may play a significant role in one’s success or failure in human relationships. _____, no eye contact is possible in the child-television relationship, although in certain children’s programs people purport to speak directly to the child and the camera fosters this illusion by focusing directly upon the person being filmed. How might such a distortion of real-life relationships affect a child’s development of trust, of openness, of an ability to relate well to other *real* people? Children who have been taught, or conditioned, to listen passively most of the day to the warm verbal communications coming from the TV screen, to the deep emotional appeal of the so-called TV personality, are often unable to respond to real persons because they arouse so much less feeling than the skilled actor.

20. Which is the most appropriate for the blank?

- ① Instead
- ② Therefore
- ③ However
- ④ Furthermore

21. According to the passage, which is true?

- ① There are diverse ways of eye contact.
- ② TV viewers should learn how to make eye contact with skilled actors.
- ③ Real people arouse much more feeling than the people on the TV screen.
- ④ Focusing on the persons on the TV screen makes children relate well to other people.

※ 다음 글을 읽고 물음에 답하시오. (22-23) [각3점]

The sense of doom in us today is not a fear of science; it is a fear of war. And the causes of war were not created by science. No, science has not invented war; but it has turned it into a very different thing. Science has enlarged the mechanism of war, and it has distorted it. Science has obviously multiplied the power of the war-makers. The weapons of the moment can kill more people more secretly and more unpleasantly than those of the past. This progress, as for want of another word I must call it—this progress has been going on for some time; and for some time it has been said, of each new weapon, that it is so destructive or so horrible that it will frighten people into their _____, and force the nations to give up war for lack of cannon fodder. This hope has

never been fulfilled, and I know no one who takes refuge in it today. The acts of men and women are not dictated by such simple compulsions; and they themselves do not stand in any simple relation to the decisions of the nations which they compose. Grapeshot and TNT and gas have not helped to outlaw war; and I see no sign that the hydrogen bomb or a whiff of bacteria will be more successful in making men wise by compulsion.

22. Which is the most appropriate for the blank?
- | | |
|--------|----------|
| ① wits | ② refuge |
| ③ idea | ④ spirit |

23. According to the passage, which is true?
- ① Science is responsible for the outbreak of war.
 - ② The development of weapons cannot stop the war.
 - ③ Men are driven by a compulsion to invent more scientific weapons.
 - ④ The high degree of danger causes the wisdom of people to stop the war.

※ 다음 글을 읽고 물음에 답하십시오. (24-25) [각3점]

As you near the equator, the weather becomes more permanently summery. There are flowers and green leaves all year long, which is why the tropics are considered a kind of paradise by many. Think about this: If we can escape to a tropical island during a northern winter, we owe our vacation to the round shape and sideways tilt of our planet. Why? The northern and southern hemispheres, as they curve away, bear the brunt of the Earth's tilt. For part of the year, New York broils in the sun. For another part, it shivers under a load of snow and freezing rain and wind. In between, it enjoys the milder weather of spring and fall. _____, those near the Earth's bulging middle aren't as affected by the tilt. The middle of the Earth doesn't lean sharply away from the sun for part of the year and toward it the next. Places near the equator get good strong sunlight year round.

24. Which is the most appropriate for the blank?
- | | |
|-----------|-------------|
| ① However | ② Thus |
| ③ Besides | ④ Similarly |

25. According to the passage, which is true?

- ① Tropical regions can have freezing weather frequently.
- ② Temperate zones are regarded as paradises by most people.
- ③ Places in the torrid zone have permanently summery weather.
- ④ New York's weather is relatively invariable throughout the year.

※ 다음 글을 읽고 물음에 답하십시오. (26-28) [각5점]

Freedom of speech is best conceived by having in mind the picture of a place like the American Congress, an assembly where opposing views are represented, where ideas are not merely uttered but debated, or the British Parliament, where men who are free to speak are also compelled to answer. We may picture the true condition of freedom as existing in a place like a court of law, where witnesses testify and are cross-examined, where the lawyer argues against the opposing lawyer before the same judge and in the presence of one jury. We may picture freedom as existing in a forum where the speaker must respond to questions; in a gathering of scientists where the data, the hypothesis, and the conclusion are submitted to men competent to judge them; in a reputable newspaper which not only will publish the opinions of those who disagree but will reexamine its own opinion in the light of what they say. _____, the essence of freedom of opinions is not in mere toleration as such, but in the debate which toleration provides: it is not in the venting of opinion, but in the confrontation of opinion. That this is the practical substance can readily be understood when we remember how differently we feel and act about the censorship and regulation of opinion purveyed by different media of communication. We find then that, in so far as the medium makes difficult the confrontation of opinion in debate, we are driven towards censorship and regulation.

26. Which is the most appropriate for the blank?

- ① Thus
- ② Instead
- ③ Contrarily
- ④ Indifferently

27. Which is the closest in meaning to the underlined part?

- ① invention
- ② release
- ③ prevention
- ④ venture

28. According to the passage, which is true?

- ① Disagreement in opinions is not important when there is regulation.
- ② Toleration is more important than debate for the freedom of speech.
- ③ Toleration and discussion should be there for the freedom of opinions.
- ④ Freedom of speech should be recommended only if there is censorship.

※ 다음 글을 읽고 물음에 답하시오. (29-30) [각5점]

As early as 1883, Wilhelm Dilthey worked out the distinction between the methods of natural science and those of history in terms of a contrast between explanation and _____. The scientist, Dilthey argued, accounts for an event in terms of its causal antecedents, while the historian tries to understand its meaning. This process of understanding is necessarily individual and even subjective. A year later, Wilhelm Windelband, the well-known historian of philosophy, also attacked the view that the historical science should imitate the methods of the natural sciences. The natural scientists aim to establish general laws while the historians try to grasp the unique and non-recurring fact. This view was elaborated and somewhat modified by Heinrich Rickert, who drew a line not so much between generalizing and individualizing methods as between the sciences of nature and the sciences of culture. The sciences of culture, he argued, are interested in the concrete and individual. Individuals, however, can be discovered and comprehended only in reference to some scheme of values, which is merely another name for culture. In France, A. D. Xénopol distinguished between the natural sciences as occupied with the ‘facts of repetition’ and history as occupied with the ‘facts of succession’. In Italy, Benedetto Croce based his whole philosophy on a historical method which is totally different from that of the natural sciences.

29. Which is the most appropriate for the blank?

- ① analysis
- ② judgment
- ③ comprehension
- ④ inference

30. Which is the main topic of the passage?

- ① The difference between general and unique laws
- ② The difference between repetition and succession
- ③ The difference between generalizing and individualizing
- ④ The difference between the methods of natural science and history

수학 [자연계열] ㉠형 [문항별 5점]

31. 극한 $\lim_{x \rightarrow 0} \left(\frac{1}{x^2} - \frac{\tan x}{x^3} \right)$ 의 값은?

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

32. 구간 $[-1, 3]$ 에서 정의된 함수 $f(x) = \frac{16x}{x^2 + 4}$ 의
최솟값을 m , 최댓값을 M 이라 할 때, $m + M$ 의 값은?

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

33. 두 곡선 $y = x - 2$, $y^2 = x$ 로 둘러싸인 영역의 넓이는?

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

34. 다음 중 수렴하는 특이적분의 개수는?

㉠. $\int_0^1 \frac{x}{1-x} dx$	㉡. $\int_{-1}^1 \frac{1}{x^2} dx$
㉢. $\int_{-2}^2 \frac{1}{\sqrt{4-x^2}} dx$	㉣. $\int_{-\infty}^{\infty} \frac{1}{(x^2+1)^2} dx$

- ① 1개 ② 2개 ③ 3개 ④ 4개

35. 멱급수 $\sum_{n=1}^{\infty} \frac{(x+1)^n \ln n}{n 3^n}$ 이 수렴하게 되는 모든
정수 x 의 개수는?

- ① 4개 ② 5개 ③ 6개 ④ 7개

36. 극곡선 $r = e^{2\theta}$ 의 길이는? (단, $0 \leq \theta \leq \pi$)

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

37. 좌표공간에서 세 점 $(1, -2, 3)$, $(4, 1, -2)$, $(-2, -3, 0)$
을 포함하는 평면과 점 $(-1, 1, 1)$ 사이의 거리는?

- ① $\frac{44\sqrt{202}}{101}$ ② $\frac{22\sqrt{202}}{101}$
③ $\frac{44\sqrt{101}}{101}$ ④ $\frac{22\sqrt{101}}{101}$

38. 벡터 \vec{u} 는 x 축의 양의 방향과 이루는 각이 $\theta = \frac{\pi}{6}$ 인
단위벡터이다. 이변수함수 $f(x, y) = x^3 - 3xy + 4y^2$ 에
대하여 방향미분계수가 $D_{\vec{u}} f(a, b) = \frac{13 - 3\sqrt{3}}{2}$
일 때, $a + b$ 의 값은? (단, a, b 는 양의 유리수)

- ① 3 ② 4 ③ 5 ④ 6

39. E 는 두 평면 $z=0$ 과 $z=x+y+5$ 및 두 원기둥 $x^2+y^2=9$ 와 $x^2+y^2=a$ ($0 < a < 9$)로 둘러싸인 입체이다. 삼중적분 $\iiint_E x dV = \frac{17}{4}\pi$ 일 때, a 의 값은?

- ① 2 ② 4 ③ 6 ④ 8

40. 이변수함수 $f(x,y) = y^2 - 2y \cos x$ 의 모든 극값의 합은? (단, $-\frac{5\pi}{4} < x < \frac{5\pi}{4}$)

- ① -5 ② -3 ③ -1 ④ 1

41. 좌표평면 위의 네 점 $(1,0), (2,0), (0,-2), (0,-1)$ 로 이루어진 사다리꼴의 경계와 내부를 R 이라 할 때,

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

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

42. 곡선 C 는 포물선 $y=x^2$ 위의 점 $(0,0)$ 에서 $(1,1)$ 까지의 호 C_1 과 점 $(1,1)$ 에서 $(3,2)$ 까지의 선분 C_2 로 구성될 때, 선적분 $\int_C 2x ds$ 의 값은?

- ① $\frac{29\sqrt{5}-1}{6}$ ② $\frac{29\sqrt{5}}{6}$
 ③ $\frac{23\sqrt{5}-1}{6}$ ④ $\frac{23\sqrt{5}}{6}$

43. 곡면 S 는 원기둥 $x^2+y^2=1$ 과 두 평면 $z=1$ 과 $z=-1$ 로 구성된다.

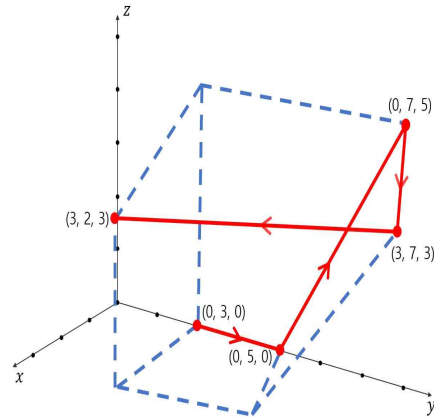
벡터장 $F(x,y,z) = \langle xy^2, x^2y, y \rangle$ 일 때, 면적분 $\iint_S \mathbf{F} \cdot d\mathbf{S}$ 의 값은?

(단, S 의 방향은 둘러싸인 영역의 바깥 방향)

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

44. 곡선 C 는 아래 그림과 같이 육면체의 변을 따라 꼭짓점 $(0,3,0)$ 에서 $(3,2,3)$ 까지 연결되는 네 개의 선분으로 구성된다.

벡터장 $F(x,y,z) = \langle y^2, 2xy + e^{3z}, 3ye^{3z} \rangle$ 일 때, 선적분 $\int_C \mathbf{F} \cdot d\mathbf{r}$ 의 값은?



- ① $9 + 2e^9$ ② $10 + 2e^9$ ③ $11 + 2e^9$ ④ $12 + 2e^9$

45. 행렬

$$\begin{pmatrix} 2 & 2 & 0 \\ 2 & 1 & 1 \\ -7 & 2 & -3 \end{pmatrix}$$

의 고유벡터가 아닌 것은?

- ① $\langle -2, 1, 4 \rangle$ ② $\langle -2, -1, 2 \rangle$
 ③ $\langle 1, 4, -4 \rangle$ ④ $\langle 1, -3, 13 \rangle$

46. 선형변환 $T: R^2 \rightarrow R^2$ 가 다음을 만족한다.
 $T(\langle 1, 0 \rangle) = \langle 1, 1 \rangle$, $T(\langle 0, 1 \rangle) = \langle -1, 1 \rangle$
 이때, 역변환 T^{-1} 의 행렬표현은?

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

47. 행렬

$$\begin{pmatrix} 3 & 1 & 2 & 4 \\ 6 & 3 & 4 & 10 \\ 3 & 2 & 2 & 9 \\ 9 & 5 & 6 & 16 \end{pmatrix}$$

의 계수(rank)는?

- ① 1 ② 2 ③ 3 ④ 4

48. 미분방정식 $\frac{dy}{dx} = \frac{1}{x+y^2}$ 의 일반해는?

- ① $x = -y^2 + 2y - 2 + Ce^y$
 ② $x = -y^2 - 2y - 2 + Ce^{-y}$
 ③ $x = -y^2 - 2y - 2 + Ce^y$
 ④ $x = -y^2 + 2y - 2 + Ce^{-y}$

49. 미분방정식

$$y'' + 2y' + 2y = 4x + 6, \quad y(0) = 0, \quad y'(0) = 0$$

의 해 $y(x)$ 에 대하여, $y'(\pi)$ 의 값은?

- ① $2(e^{-\pi} + 1)$ ② $-2(e^{-\pi} + 1)$
 ③ $2(e^{-\pi} - 1)$ ④ $-2(e^{-\pi} - 1)$

50. \mathcal{L} 를 라플라스 변환(Laplace transform)이라 할 때,

$$\mathcal{L}\left(\frac{e^t - e^{-t}}{t}\right) \text{는?}$$

- ① $e^{\frac{s+1}{s-1}}$ ② $e^{\frac{s-1}{s+1}}$
 ③ $\ln\left|\frac{s+1}{s-1}\right|$ ④ $\ln\left|\frac{s-1}{s+1}\right|$

영어 정답표 [자연계열] ㉠ 형

문제번호	1	2	3	4	5	6	7	8	9	10
정답	㉠	㉡	㉢	㉣	㉤	㉥	㉦	㉧	㉨	㉩
배점	3	3	3	3	3	3	3	3	3	3

문제번호	11	12	13	14	15	16	17	18	19	20
정답	㉣	㉤	㉢	㉣	㉤	㉦	㉢	㉣	㉤	㉩
배점	3	3	3	3	3	3	3	3	3	3

문제번호	21	22	23	24	25	26	27	28	29	30
정답	㉢	㉢	㉤	㉢	㉤	㉢	㉤	㉥	㉥	㉩
배점	3	3	3	3	3	5	5	5	5	5

수학 정답표 [자연계열] ㉠ 형

문제번호	31	32	33	34	35	36	37	38	39	40
정답	㉢	㉤	㉥	㉣	㉥	㉣	㉣	㉢	㉤	㉣
배점	5	5	5	5	5	5	5	5	5	5

문제번호	41	42	43	44	45	46	47	48	49	50
정답	㉣	㉢	㉤	㉢	㉥	㉣	㉥	㉥	㉢	㉥
배점	5	5	5	5	5	5	5	5	5	5