

영어+수학 A형(40문항, 70분)

2022학년도 편입학 전형

● 지망학부(과) : _____ 성명 : _____ 가번호 : _____

● 유의사항

1. 문제지에 지망학부(과), 성명, 가번호를 정확히 쓰시오.
2. OMR 답안지에 지망학부(과), 성명, 가번호를 정확히 쓰고, 가번호를 마킹하시오.
3. OMR 답안지는 컴퓨터용 사인펜으로 마킹하고, 답 이외에는 어떠한 표기도 하지 마시오.
4. OMR 답안지의 “문제유형”란에 문제지 상의 문제유형 A를 마킹하시오.
5. 시험 종료 후 OMR 답안지와 문제지를 모두 제출하시오.

영 어 25문항 (1-25)

I. Choose the one that is closest in meaning to the underlined word. (1-9)

1. He is the guy everyone goes to when they have any IT related issues. Even though he is an accountant, he is very proficient at troubleshooting software and hardware issues.

① muggy	② skillful
③ gibberish	④ ephemeral
2. When Hollywood got on the patriotic bandwagon and produced *Why We Fight for*, a documentary film about the armed forces of the Second World War, it found that the graphic depiction of enemy atrocities actually drove enrollments down.

① vivid	② deprecated
③ drawn	④ speechless
3. The prime minister and the opposition party leader let their dispute over the new bill escalate to ugly and destructive proportions.

① stagnate	② resume
③ intensify	④ dwindle
4. Thus, sand or pounded glass, which is white to the naked eye, is pellucid in a microscope.

① indecent	② transitory
③ filthy	④ transparent
5. With the cramped spaces of the rainforest substituting for the cramped spaces of the trench, this sensation also introduces new sensory dimensions: the lush vitality of the foliage, and the verdant potentiality of the mud.

① green	② grounded
③ emerging	④ real

6. Once one had crossed the torrid regions, where human survival had long been assumed to be impossible, one would find lands that were as fertile and habitable as the northern hemisphere.

① scorching	② benign
③ equatorial	④ connecting
7. His discourse theory of citizenship recognizes the fluid, multimodal, and quotidian enactments of citizenship in a multiple public sphere.

① reclusive	② everyday
③ quarterly	④ dictated
8. Despite having lived what he considered to be a trivial life, George had actually had a tremendous impact on everyone he knew.

① frivolous	② prodigious
③ remorseful	④ insolvent
9. Thus, caution should be advised when importing conclusions from one contentious problem into the area of another even more abstract and disputable one.

① controversial	② restive
③ preposterous	④ foolproof

II. Choose the word that is grammatically most inappropriate. (10-15)

10. Some of the old worries about AI were ①closely linked to the question of ②whether computers could think. The first massive electronic computers, capable ③of rapid computation and little or no creative activity, were soon ④dubbing “electronic brains.”

자 연 A

11. Theorists and writers ①have recuperated not just stories of slaves and slave owners but also the narrative of European modernity, wealth, and privilege, and have demonstrated how black labor and black intellectual ②work must be understood as ③having created European modernity, and not as if it ④was created by it.
12. ①A number of companies and agencies in the developed world ②has already ③set to work trying to bring the benefits of the new technologies ④ to developing countries.
13. ①At every point in ②his wide-ranging career, Alan Bennett demonstrated ③us his signature ability ④to tread the line between what he calls 'the edge of tragedy and the edge of comedy.'
14. When I met him in the museum ①unexpectedly, he was ②standing up in front of a mesmerizing statue which was not ③known to visitors with his tears ④stream down his face.
15. He confessed ①that the reason ②for him to visit his sister's house last month was ③because she wanted him to return her painting which she ④had bought in Canada.

III. Choose the one that is most suitable for the blank. (16-19)

16. This is a problem that afflicts humanity from its beginnings: the division of the jouissance of manual labor for Adam and the pain of _____ labor for Eve.
- ① obtuse ② obfuscated
③ obvolute ④ obstetric
17. Engineering Management, the study of the application of engineering principles to the planning and operational management of industrial and manufacturing operations, is a _____ discipline, part engineering and part business management, that requires an understanding of both fields.
- ① hybrid ② prudent
③ hypothetical ④ profound
18. Neural networks and genetic algorithms are examples of methods that _____ excitement in the 1990s by appearing to offer alternatives to the stagnating paradigm.
- ① stimulated ② tranquilized
③ deprived ④ regressed

19. The trials were made only on small animals, but in each case the alleged remedy proved _____ despite many desperate patients' expectations.
- ① delicate ② inefficacious
③ recurrent ④ permissive

IV. Read the following passage and answer the questions. (20-22)

Interestingly, the multiplayer online version is very different. You shoot not monsters but other players, who are running around trying to kill you. And they aren't depersonalized: they look just like you, you can chat with them (but rarely do because the game is too fast-paced), and so forth. This has been portrayed as something new and frightening - _____, frankly, it's no different from paintball and not much different from tag.

The development of shooting games over time has not been toward more and more violence; rather, it's been toward prettier and more-impressive 3D rendering and toward more compelling story-lines, interwoven more effectively with the game.

Yes, there are violent games - but as is usually the case when the media latches onto something, they have been caricatured.

Violence is only a part of their appeal. The idea that film or television or books make people violent has been debunked again and again. But perhaps computer games are different - so uniquely compelling that violence in games does breed violent behavior?

Violence, and the attraction of violence, is a fundamental part of human nature. It is particularly appealing to young adolescent males, for it is a clean break with the rules-bound environment in which they have lived, a rejection of parental order. In every society, violence is most common among young men.

It is foolish to try to change human nature. It is immutable, or mutable only through the slow process of evolution. What can be changed is society. Society can develop institutions and mechanisms to channel antisocial impulses to pro-social purposes. That's one reason for (A) armies, of course; they institutionalize violence in a mechanism designed to protect rather than damage society.

20. Which of the following is most appropriate for the blank?
- ① and
② therefore
③ but
④ in the mean time

자연 A

21. According to the passage, which of the following is most likely to be true?

- ① Shooting games have been changed into more violent ones due to elaborated 3D rendering representation.
- ② The mechanism of killing other players at multiplayer online games is very similar with paintball.
- ③ Young adolescents are attracted to violence regardless of their gender.
- ④ Impressive story-lines don't play a key role in attracting more players for a shooting game.

22. Why does the author mention (A) armies in the passage?

- ① Multiplayer shooting games are usually used at an army recruiting center.
- ② Experience as a soldier can change human nature into drastic way.
- ③ Armies show how society can channel negative impulse to beneficial purpose for society.
- ④ There are many young males who play shooting games at a boot camp.

V. Read the following passage and answer the questions. (23-25)

Our world is in the midst of a crisis of biodiversity. The U.N. estimates that at least a million species are at risk of extinction, many within decades, and warns that we keep speeding them toward oblivion by converting more and more of the world's natural spaces into human ones. Already, we've significantly changed three-quarters of the planet's land and two-thirds of its oceans, squeezing out untold numbers of wild creatures.

Yet there's a small subset of animals that are doing remarkably well. Known as synanthropes, these are the tiny minority of wild animals - not livestock or pets - that have adopted to thrive in the places that humans like and are forever building more of. City pigeons - the descendants of rock doves, birds that roost on steep cliff faces - are a good example. After the birds were partly domesticated as food and messengers, they learned to nest in the crevices of buildings and to eat our trash, and their numbers followed our skyscrapers upward. Other familiar examples include opossums, coyotes, raccoons, rats, wild turkeys, Canada geese, and crows. Some researchers have observed the latter using cars to crack walnuts, timing the stops between traffic-light changes in order to slip the nuts underneath the tires. Other birds have learned to line their nests with

cigarette butts, whose residual nicotine keeps mites away. Some urban populations - such as lizards, whose toes are becoming more grippy, the better to climb glass and concrete instead of trees - seem to be actively evolving to live in the habitats that we're creating. Mice in Central Park have developed genes that allow them to metabolize fatty foods and rancid peanuts; mountain lions that live near the Seattle exurbs have shifted their predation from ungulates to rats, opossums, and raccoons. Studies have shown that many synanthropes are actually more successful - living at greater densities and achieving larger body sizes - in urban and suburban landscapes than they are in the wild.

23. According to the passage, biodiversity is under crisis because _____.

- ① the competition between different species of animals becomes more vehement
- ② the space where wild animals can live is being reduced
- ③ animals in the planet's land are moving to the space nearby its oceans
- ④ humans' effort to preserve biodiversity have recently failed

24. According to the passage, which of the following is NOT true?

- ① Many animals lost their places for living because of humans.
- ② Some animals have learned to use humans' tools to get food.
- ③ Some synanthropes can even evolve to live with humans and digest their food.
- ④ Most wild animals manage to survive in humans' place for living.

25. According to the passage, some birds collect humans' cigarette butts because _____.

- ① they can be used to protect them from humans
- ② they can even digest them
- ③ their nicotine can keep harmful insects away from them
- ④ they have instincts to collect anything from humans

(수학: 다음 페이지부터)

자연 A

수학 15문항 (26-40)

26. $y^x = x^y$ 위의 점 (1, 1)에서 $\frac{dy}{dx} + \frac{d^2y}{dx^2}$ 의 값을 구하시오.

- ① -1 ② 0 ③ 1 ④ 2

27. 함수 $f(x)$ 가 다음과 같다.

$$f(x) = \begin{cases} \frac{e^x + 1}{e^x + x} & (0 \leq x \leq 1) \\ \frac{(\ln x)^2}{x} + 1 & (x \geq 1) \end{cases}$$

이 때 $\int_0^2 f(x)dx$ 를 구하시오.

- ① $\ln(e^2 + 2) + \frac{(\ln 2)^3}{3} + 1$ ② $\ln(e + 1) + \frac{(\ln 2)^3}{3} + 1$
 ③ $\frac{e^2 + 1}{e^2 + 2} + \frac{(\ln 2)^2}{2}$ ④ $-\infty$

28. (가)~(다) 중에서 옳은 것의 개수를 구하시오.

(가) $(\cosh 2x + \sinh 2x)\cos(\arctan x) = \frac{e^{2x}}{\sqrt{x^2 + 1}}$

(나) $\int \left(\frac{1}{\sqrt{1-x^2}} + \frac{1}{\sqrt{1+x^2}} \right) dx = \sin^{-1}x + \ln(x + \sqrt{1+x^2}) + C$
 (C 는 상수)

(다) $\int \frac{\sinh(\ln x)}{x} dx = \frac{1}{2} \left(x + \frac{1}{x} \right) + C$
 (C 는 상수)

- ① 0개 ② 1개 ③ 2개 ④ 3개

29. 거듭제곱급수 $\sum_{n=1}^{\infty} \frac{n!}{2^n n^n} x^n$ 의 수렴반지름을 구하시오.

- ① 2 ② $\frac{1}{2e}$ ③ $2e$ ④ ∞

30. 행렬식이 k 인 3×3 행렬 A 가 다음과 같이 주어져 있다.

$$A = \begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}$$

다음 중 행렬식이 k 와 같지 않은 행렬을 고르시오. (단, $k \neq 0$)

① $B = \begin{bmatrix} c_1 & c_2 & c_3 \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{bmatrix}$

② $C = \begin{bmatrix} 2a_1 - 4c_1 & a_2 - 2c_2 & a_3 - 2c_3 \\ 6b_1 + 2c_1 & 3b_2 + c_2 & 3b_3 + c_3 \\ 2c_1 & c_2 & c_3 \end{bmatrix}$

③ $D = \begin{bmatrix} \frac{2}{3}a_1 & \frac{a_2}{3} & a_3 \\ 2b_1 & b_2 & 3b_3 \\ c_1 & \frac{c_2}{2} & \frac{3}{2}c_3 \end{bmatrix}$

④ $E = \begin{bmatrix} a_1 + 2a_2 + 3a_3 & a_2 & a_3 \\ b_1 + 2b_2 + 3b_3 & b_2 & b_3 \\ c_1 + 2c_2 + 3c_3 & c_2 & c_3 \end{bmatrix}$

31. $x = s^2 - t^2$, $y = st$, $z = f(x, y)$ 이고, f 의 1계와 2계 편도함수들이 연속이다. (가)~(라)에 해당되는 수식이 옳지 않게 제시된 것을 고르시오.

$$\frac{\partial^2 z}{\partial s^2} = \left(\text{가} \right) \frac{\partial z}{\partial x} + \left(\text{나} \right) \frac{\partial^2 z}{\partial x^2} + \left(\text{다} \right) \frac{\partial^2 z}{\partial x \partial y} + \left(\text{라} \right) \frac{\partial^2 z}{\partial y^2}$$

- ① (가) : 2 ② (나) : $4s^2$ ③ (다) : $2st$ ④ (라) : t^2

32. 공간 직선 $z = x + 1$, $y = 1$ 을 z 축을 중심으로 회전하여 얻은 곡면 위의 점 (2, 1, 3)에서 이 곡면의 접평면의 식을 구하시오.

- ① $x - 2y - z + 3 = 0$ ② $2x + y - z - 2 = 0$
 ③ $x - 2y - 2z + 6 = 0$ ④ $2x + y - 2z + 1 = 0$

자연 A

33. 곡선 $C : y = x^4$ ($x=0$ 에서 $x=1$ 까지)을 따라 힘 $\vec{F}(x, y) = (2x + e^{-y})\hat{i} + (4y - xe^{-y})\hat{j}$ 가 한 일을 구하고자 한다. (가)~(다) 중 옳은 것을 모두 모은 보기를 고르시오.

- (가) \vec{F} 는 보존장이다.
 (나) \vec{F} 의 퍼텐셜 함수 $\phi(x, y)$ 가 존재하며,
 $\phi(x, y) = x^2 + xe^{-y} + 2y^2 + k$ (k 는 상수)이다.
 (다) \vec{F} 가 곡선 C 를 따라 한 일은 곡선 $y = x$ ($x=0$ 에서 $x=1$ 까지)를 따라 한 일과 같다.

- ① (가), (나) ② (가), (다)
 ③ (나), (다) ④ (가), (나), (다)

34. 공간 곡면 S_1, S_2, S_3 와 곡선 C , 그리고 평면영역 R 은 다음과 같이 정의되었다.

- $S_1 : z = 9 - x^2 - y^2, z \geq 0$
 $S_2 : z = x^2 + y^2 - 9, z \leq 0$
 $S_3 : z = \sqrt{9 - x^2 - y^2}$
 $C : x^2 + y^2 = 9, z = 0$
 $R : xy$ 평면 내 $x^2 + y^2 \leq 9$ 인 영역

벡터장 $\vec{G}(x, y, z) = \frac{1}{1+y^2}\hat{i} + 2ze^{x^2}\hat{j} + y^2\hat{k}$ 가 주어졌을

때, 다음 중 선적분 $\oint_C z^2 e^{x^2} dx + xy^2 dy + \tan^{-1} y dz$ 와 다른 것을 고르시오. 단, 곡선 C 의 방향은 위(z 축의 양의 방향)에서 보았을 때 시계 반대 방향이며, 곡면 S_1, S_2, S_3 의 방향은 곡면이 볼록한 쪽의 방향이다.

- ① $\iint_{S_1} \vec{G} \cdot \vec{ndS}$ ② $\iint_{S_2} \vec{G} \cdot \vec{ndS}$
 ③ $\iint_{S_3} \vec{G} \cdot \vec{ndS}$ ④ $\iint_R y^2 dA$

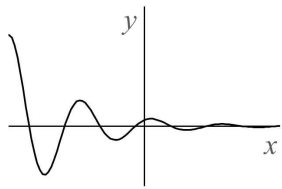
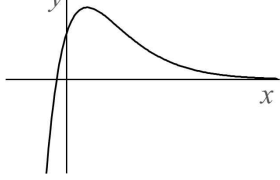
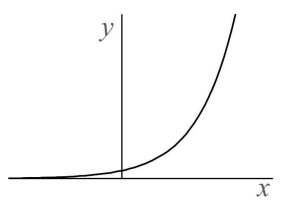
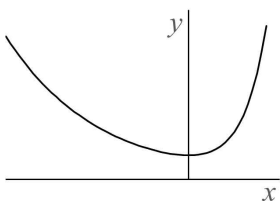
35. 자율미분방정식 $\frac{dy}{dt} = y^5 - 2y^4 - y^3 + 2y^2$ 의 점근적으로 안정한 평형점의 개수를 구하시오.

- ① 1 ② 2 ③ 3 ④ 4

36. 용기 안에 농도 $4g/l$ 의 소금물이 $200l$ 들어있다. 유입구를 통해 농도 $3g/l$ 의 소금물이 분당 $8l$ 씩 들어오고 있으며 동시에 분당 $8l$ 의 소금물이 유출구를 통해 나가고 있다. 용기 내부의 소금물은 연속적으로 완전 혼합 상태를 가정한다. $S(t)$ 는 시간 t 일 때 소금의 질량이다. 다음 중 옳은 문장을 고르시오.

- ① $S(t)$ 의 변화율은 $\frac{dS}{dt} = 24 - \frac{2}{25}S$ 로 표현된다.
 ② $t \rightarrow \infty$ 일 때 $S(t)$ 는 $600g$ 로 수렴한다.
 ③ $S(t)$ 는 처음에는 증가하다 다시 감소한다.
 ④ $t=0$ 일 때 용기 안의 소금물이 농도가 변하지 않은 채로 부피가 더 크다고 가정하면, $t \rightarrow \infty$ 일 때 소금물 농도의 수렴값은 초기 부피에 비례해서 커진다.

37. 미분방정식 $y'' + 2y' + 22y = 0$ 의 한 특수해의 개형으로 옳은 것을 고르시오.

- ①  ② 
- ③  ④ 

38. $f(t) + \int_0^t f(\tau) d\tau = 2022$ 를 만족하는 $f(t)$ 에 대하여 $f(1)$ 을 구하시오.

- ① 1011 ② 2022 ③ $2022e$ ④ $2022e^{-1}$

자 연 A

39. 함수 $f(x)$ 와 $f(x)$ 의 Fourier 적분은 각각 다음과 같다.

$$f(x) = \begin{cases} 0, & x < 0 \\ x, & 0 < x < 3 \\ 0, & x > 3 \end{cases}$$

$$f(x) = \frac{1}{\pi} \int_0^{\infty} \frac{3\alpha \sin\alpha(3-x) + \cos\alpha(3-x) - \cos\alpha x}{\alpha^2} d\alpha$$

이를 이용하여 다음 적분을 구하시오.

$$\int_0^{\infty} \frac{1 - \cos 3\alpha}{\alpha^2} d\alpha$$

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

40. 길이가 L 인 막대가 x 축의 구간 $[0, L]$ 에 놓여 있고 막대 내에서 x 축 방향으로 열전도가 일어날 때, 다음과 같이 경계값 문제가 주어졌다.

$$k \frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial t}, \quad 0 < x < L, \quad t > 0$$

$$\left. \frac{\partial u}{\partial x} \right|_{x=0} = 0, \quad u(L, t) = 0, \quad t > 0$$

$$u(x, 0) = f(x), \quad 0 < x < L$$

위 문제 상황과 맞지 않는 것을 고르시오.

- ① $u(x, t)$ 는 항상 평형 상태의 온도를 나타낸다.
 ② 초기 온도는 $0 < x < L$ 인 x 에 대해 $f(x)$ 이다.
 ③ 막대의 왼쪽 끝($x=0$)은 단열되어 있다.
 ④ 막대의 오른쪽 끝($x=L$)의 온도는 0으로 유지된다.