

영어+수학 A형(40문항, 70분) [홈페이지 공지용]

2018학년도 편입학 전형 (서울)

● **지망학부(과) :** **성명 :** **수험번호 :**

● **유의사항**

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

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

1. A preserved fossil is one that remains intact because of the method in which it was fossilized.

① unearth	② imperfect
③ immobile	④ unimpaired
2. Teachers can use a few strategies to circumvent common problems with technology to help students gain the numerous benefits of stimulating technology projects.

① stay away from	② get a sense of
③ take on	④ stock up on
3. Most of the industrial firms will struggle to realize exiguous margins at the lower reaches of global industrial production chains.

① exact	② arrant
③ scarce	④ fickle
4. We are now witnessing the proliferation of fake tweets, which are screen shots of what appear to be tweets but in fact are fabricated.

① surge	② stagnation
③ infusion	④ reactivity
5. The United States has struggled to invigorate an economy marred by slow job creation and high unemployment.

① dishearten	② revitalize
③ enunciate	④ improvise
6. The president was so proud that the reporter praised him, oblivious that he was being manipulated by wily media.

① smudging	② attentive
③ speculating	④ unthinking
7. It is likely therefore that even though Nietzsche has repeatedly been proclaimed as a proto-posthumanist thinker, he would probably not be particularly impressed with the current widespread posthumanist techno-euphoria.

① genuine	② original
③ late	④ previous
8. There is another scene in the film in which various stereotypes about black men are rehashed by a group of clueless white guests.

① repealed	② defended
③ repeated	④ determined
9. Parents may feel undermined when children get tools of information and inquiry not available to adults and use them in ways that seem to threaten adult-held values.

① frightened	② damaged
③ proud	④ isolated

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

10. Roads and canals ①were increasingly privately held, meaning ②what non-elite free farmers were entirely dependent ③on the patronage of planters ④to conduct their business.
11. For many returning ①resident, there is the question of ②where to relocate or rebuild ③in one of the country's most expensive housing ④markets.
12. The legal economists' leading objection ①might lose its power if it ②were possible ③to explain how enforcement of exploitative contracts ④entail significant risks and heavy social costs.

21. According to the passage, which of the following CANNOT be inferred?
- ① Forensic science deals with understanding of the past by reconstructing past events.
 - ② Forensic epidemiology contributes to stopping the spread of dangerous diseases.
 - ③ Remains on teeth of the dead body can hint at the person's habit.
 - ④ Deadly bacteria and virus cause difficulties in forensic pathologists' examining tissues.
22. Which of the following is closest to the way in which the passage is organized?
- ① Spatial order
 - ② Chronological order
 - ③ Question and answer
 - ④ Main idea with supporting lists

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

Running became imperiled a few years ago, in the thick of the Me Decade and just as the Culture of Narcissism was reaching its zenith. Suddenly it became chic to worry about your waistline, sagging chin, and flaccid muscles. Then James Fixx wrote *The Complete Book of Running*, which quickly lapped all the other self-help, guru, and diet books on the bestseller lists. Overnight, it seemed, running has zoomed from weird to respectable, even fashionable. Everyone who was anyone was trotting around in 60 dollars running shoes and flashy warmup suits from Bloomingdale's. Some trendies, unfortunately, really got hooked. It was not enough simply to run and be run over in Central Park. To prove your mettle, you had to race, and of course, this meant that eventually, you had to run the ultimate race — the marathon — and the ultimate marathon — Boston.

Soon, what had once been a nice little neighborhood jaunt in Beantown and environs became a veritable Jock Woodstock. As the field climbed past three, then four, then five thousand runners, the race organizers, in a desperate attempt to cope with the chaos, began imposing qualifying times. Last year, any man under 40 years of age who wished to run with an official number had to have completed a certified marathon in less than three hours. Even with that restriction, though, more than 7,800 officially qualified runners showed up. This year, with the qualifying time for men under 40 lowered to a fast-stepping 2 hours 50 minutes, about 6,000 are expected to run.

I failed to qualify. Oh, I suppose I could have if I had been willing to spend a couple of hours each day running 15 miles or more. But I'm too busy to devote

so much time to it. I still regard it as a hobby, something I do in my spare time for fun. That's what Boston was all about, I thought then and still think now. It's a chance for hams and shams, and desk-bound Walter Mittys to realize their dreams of athletic glory. For a few bucks, some stinging blisters, some aching joints — and some guts — any plumber or professor can rub shoulders with running's great and go home bragging to family and friends that, yes, he was there, he took part in the World Series of Running, the Super Bowl of Marathoning, and what's more, finished.

23. Which of the following is NOT true about the author of the passage?
- ① The author would not identify himself with the trendies who easily get hooked.
 - ② The author feels sorry for the passing of an American pastime.
 - ③ The author's tone toward the Boston Marathon sounds cynical.
 - ④ The author thinks highly of the everyone's dream of athletic glory.
24. The underlined word "it" in the third paragraph refers to
- ① running a race
 - ② proving my mettle
 - ③ keeping up with new trends
 - ④ taking part in the Boston Marathon
25. Which of the following can be inferred from the passage?
- ① It is no longer chic for an athlete to run in Central Park.
 - ② A growing number of runners are enthusiastic about the marathon.
 - ③ The qualifying time is designed to help the marathoners break the record.
 - ④ The World Series and the Super Bowl came into conflict with the Boston Marathon.

수 학 15문항 (26-40)

26. 행렬 $\begin{bmatrix} 1 & 2 & 2 \\ 3 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$ 의 역행렬을 $B = [b_{ij}]$ 라 할 때, b_{32} 를 구하시오.

- ① -1 ② 1 ③ -6 ④ 6

27. 다음 극방정식의 그래프의 모양을 잘못 나타낸 것을 고르시오.

- ① $r = \theta, \theta > 0$: 나선형
 ② $r = \sin 4\theta$: 8개 잎의 꽃잎모양
 ③ $r = 4 \sin \theta$: 원점을 지나는 원 (반지름 2)
 ④ $r = \sec \theta$: 수평선

28. 다음 극한을 구하시오.

$$\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{n}{n^2 + k^2}$$

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

29. 다음 거듭제곱급수 중에서 수렴반경이 가장 작은 것을 고르시오.

- ① $\sum_{n=1}^{\infty} \frac{3^n}{n} x^n$ ② $\sum_{n=0}^{\infty} \frac{2^n}{n!} x^n$
 ③ $\sum_{n=0}^{\infty} x^{2n}$ ④ $\sum_{n=1}^{\infty} \frac{1}{n(n+1)} x^n$

30. $f(x) = 2x^2 \sqrt{1+x^3}$ 일 때 $f^{(17)}(0)$ 의 값을 구하시오.

- ① $\frac{1 \cdot 3 \cdot 5 \cdots 31}{2^{16}}$ ② $\frac{1 \cdot 3 \cdot 5 \cdots 31}{2^{16} 17!}$
 ③ $\frac{7}{2^7}$ ④ $\frac{7 \cdot 17!}{2^7}$

31. 원점을 중심으로 반지름이 1인 원을 점 (1, 0)에서 시작해서 반시계방향으로 한 바퀴 도는 경로를 C 라 하자. 다음 주어진 벡터장을 C 를 따라 선적분한 값이 0이 아닌 것을 고르시오.

- ① $\langle 2xy, x^2 \rangle$ ② $\langle -e^{-x}y^2, 2e^{-x}y \rangle$
 ③ $\langle e^x \sin y, e^x \cos y \rangle$ ④ $\langle -2x^2y, 2xy^2 \rangle$

32. 미분가능한 함수 f, g 가 $f(1) = 3, f'(1) = 4, (g \circ f)'(1) = 8$ 을 만족할 때 이로부터 알 수 있는 사실을 고르시오.

- ① $g'(3) = 2$ ② $g'(1) = 8$
 ③ $g'(1) = 2$ ④ $g(1) = 3$

33. 영벡터가 아닌 두 3차원 벡터 \mathbf{a} 와 \mathbf{b} 에 대해서, 다음 중 \mathbf{b} 와 수직이 아닐 수 있는 것을 고르시오. (단, $\text{proj}_{\mathbf{a}}\mathbf{b}$ 는 벡터 \mathbf{a} 로 내린 \mathbf{b} 의 사영벡터이다.)

- ① $\mathbf{a} \times \mathbf{b}$ ② $\mathbf{b} - \text{proj}_{\mathbf{a}}\mathbf{b}$
 ③ $(\mathbf{a} - 2\mathbf{b}) \times (\mathbf{b} - 2\mathbf{a})$ ④ $(\mathbf{b} \cdot \mathbf{b})\mathbf{a} - (\mathbf{a} \cdot \mathbf{b})\mathbf{b}$

34. 다음 미분방정식 $\frac{dy}{dx} = (y-1)(y-2)(y-3)$ 의 안정적 임계점(stable equilibrium)을 찾으시오.

- ① 1 ② 2
 ③ 3 ④ 존재하지 않는다.

35. 다음 보기 (a)~(d) 중에서 미분방정식 $y^{(4)} + 3y'' - 4y = -4x^3 + 18x$ 의 해가 되는 것의 개수를 구하시오.

- (a) $x^3 + 2\cosh x - \sin 2x$ (b) $x^3 + \cos 2x$
 (c) $x^3 - \sinh 2x$ (d) $x^3 + 3e^x$

- ① 1개 ② 2개 ③ 3개 ④ 4개

36. 윗면은 $x^2 + y^2 + z^2 = z$, 아랫면은 $z = \sqrt{x^2 + y^2}$ 인 영역의 부피를 적분으로 바르게 표시한 것을 고르시오.

- ① $\int_0^{2\pi} \int_0^{\frac{1}{2}} \int_r^{r^2} r \, dz \, dr \, d\theta$
 ② $\int_0^{2\pi} \int_0^{\frac{1}{2}} \int_r^{\sqrt{1-r^2}} r \, dz \, dr \, d\theta$
 ③ $\int_0^{\frac{\pi}{4}} \int_0^{2\pi} \int_0^1 \rho^2 \sin \phi \, d\rho \, d\theta \, d\phi$
 ④ $\int_0^{\frac{\pi}{4}} \int_0^{2\pi} \int_0^{\cos \phi} \rho^2 \sin \phi \, d\rho \, d\theta \, d\phi$

37. 호그와트 마법학교의 총인원은 600명이다. 개학일에 학생 중 1명이 가벼운 감기에 감염되어 입교하였다. 감염자 수 $x = x(t)$ 의 증가속도가 감염자 수와 비감염자 수의 곱에 비례하는 조건으로 수학적 모델링을 하였을 때, 함수 $x = x(t)$ 가 만족하지 않는 식을 고르시오. (개학일은 $t = 0$ 으로 한다.)

- ① $\frac{dx}{dt} = kx(600 - x), x(0) = 1$
 ② $\frac{x}{600 - x} = 599e^{600kt}$
 ③ $x = \frac{600}{1 + 599e^{-600kt}}$
 ④ $\frac{d^2x}{dt^2} = k^2x(600 - x)(600 - 2x)$

38. 두 곡면 $x^4 + y^4 + z^4 = 18, x^3 + 2y^3 + z^3 = 18$ 이 점 (a, b, c) 에서 접할 때 $a + b + c$ 의 값을 구하시오.

- ① -4 ② 0 ③ 4 ④ 6

39. 벡터장 $\mathbf{F} = \langle z, y, x \rangle$ 의 단위 구면의 바깥 방향 유량(flux)과 같지 않은 것을 고르시오. 단, B 는 단위 구체, S 는 단위 구면, D 는 xy 평면에서의 단위원 영역이다.

- ① $\iiint_B 1 \, dV$
 ② $\iint_S (2xz + y^2) \, dS$
 ③ $\iint_D \left(2x + \frac{y^2}{\sqrt{1-x^2-y^2}} \right) \, dA$
 ④ $\iint_S \mathbf{F} \cdot \mathbf{n} \, dS$ (\mathbf{n} 은 단위구면의 바깥 방향 단위법벡터)

40. 다음 중 $0 < x < \pi$ 의 범위에서 $f(x) = x$ 와 같지 않은 것을 고르시오.

- ① $\sum_{n=1}^{\infty} \frac{2(-1)^{n+1}}{n} \sin nx$
 ② $\frac{\pi}{2} + \frac{2}{\pi} \sum_{n=1}^{\infty} \frac{(-1)^n - 1}{n^2} \cos nx$
 ③ $\frac{\pi}{2} + \sum_{n=1}^{\infty} \left(\frac{(-1)^n - 1}{n^2 \pi} \cos nx + \frac{(-1)^{n+1}}{n} \sin nx \right)$
 ④ $\frac{\pi}{2} - \sum_{n=1}^{\infty} \frac{\sin 2nx}{n}$