자연 계열 (영어+수학)(30문항, 60분)

2018학년도 수시 재외국민과 외국인 특별전형

● **지망학부(과) :**   **수험번호 :**   **성명 :**

● **유의사항**
1. 문제지와 OMR 답안지에 지망학부(과), 성명, 수험번호를 정확히 쓰고, 수험번호를 마킹하시오.
2. OMR 답안지는 컴퓨터용 사인펜으로 마킹하고, 답 이외에는 어떠한 표기도 하지 마시오.
3. OMR 답안지의 위에 있는 응시과목이 "영어+수학" 이라고 표시된 곳에 마킹이 되어 있는지 확인하시오.
4. OMR 답안지의 1번 ~ 30번 란에 정답을 표시하시오.
5. 시험 종료 후 OMR 답안지와 문제지를 모두 제출하시오.

영 어 (1-20)

I. 다음 빈 칸에 들어갈 가장 적당한 표현을 고르시오. (1-6)

1. The crowd got carried _____ by the chief financial officer's speech.

  ① off   ② out
  ③ away   ④ over

2. Dwelling excessively on loss would be morbid; one has to get _____ with life.

  ① up   ② down
  ③ to   ④ on

3. Brent has been calm and extremely congenial when he has been pulled over by the _____.

  ① police   ② driver
  ③ dealer   ④ dentist

4. Most people consider the landscape to be unchanging, but Earth is a dynamic body and its surface is _____ altering.

  ① destructively   ② relatively
  ③ continually   ④ influentially

5. Copernicus paid a price for dislodging Man from the _____ of the universe, and so did his philosophical counterpart Benedictus de Spinoza.

  ① end   ② beginning
  ③ order   ④ center

6. The immigration law recently proposed by the party is _____; people still argue pros and cons of the law.

  ① controversial   ② analytic
  ③ cogent   ④ logical

II. 다음 밑줄 친 부분 중 가장 어색한 표현을 고르시오. (7-11)

7. As ① a medium, the Internet is brilliantly efficient at ② shifted information from the hands of ③ those who have it ④ into the hands of those who do not.

8. The Selfish Gene ① has criticized for anthropomophic personification ② and this too needs ③ an explanation, if not an apology. I employ ④ two levels of personification: of genes, and of organisms.

9. It often turns out ① on closer inspection ② which acts of apparent altruism ③ are really selfishness ④ in disguise.

10. Now, experts ① say, a dangerous new kind of chain reaction ② is getting under way in space, ③ where it threatens ④ limit mankind's endeavors beyond the planet.

11. During World War I, Britain rained down a phenomenal number of ① leaflet, nine ② million in all, in 90 varied designs on German trenches. During World War II, Joseph Goebbles, the master of mass psychology, ③ used modern media ④ to let loose his virulent anti-Jewish campaign.

III. 다음 밑줄 친 부분의 의미와 가장 가까운 표현을 고르시오. (12-17)

12. The burden of this essay was to demonstrate that targeting whole cities for annihilation was a crime against humanity.

  ① carnage   ② hegemony
  ③ incongruity   ④ toxication

13. Hudson River began changing with each stroke of the paddle, from placid to <u>perilous</u>.

   ① steady   ② awkward
   ③ urgent   ④ hazardous

14. George would soon be here to <u>commence</u> work, and Harry did not want to meet him.

   ① supply   ② cease
   ③ initiate   ④ transfer

15. The four-trajectory model was chosen as the most <u>parsimonious</u> but informative description of the study data.

   ① peppery   ② stingy
   ③ sturdy   ④ generous

16. I can only say that I have been very conscious of these dangers, but that they seemed to be <u>outweighed</u> by the advantages of the attempt.

   ① enhanced   ② lifted
   ③ exceeded   ④ understood

17. Rather than propose a new theory or <u>unearth</u> a new fact, often the most important contribution a scientist can make is to discover a new way of seeing old theories or facts.

   ① conceal   ② invent
   ③ underscore   ④ exhume

Ⅳ. 다음 글을 읽고 물음에 답하시오. (18-20)

Think of each million years since the beginning of the universe as a page in a book. Today that bookshelf of the Universe would hold 30 volumes of 450 pages each. The first 21 volumes would have nothing in them about life. Both DNA sequence and fossil evidence agree that the informational molecule DNA would have been born some time in volume 21, because archeobacteria, the first form of life, would appear in the sea in volume 22.

Bacteria would continue to be the only shape life took for volume 23 and 24 as well, though the ones emerging in volume 24 would change the planet's atmosphere to one rich oxygen by bacterial photosynthesis. Big-celled forms of life like paramecia and diatoms would appear for the first time in volume 25. Living things made of many big cells would appear in volume 27. Animals would remain in the seas where life had begun until the first forms of animal life that appeared on land, the first tetrapods, march on shore at the end of volume 29.

Dinosaurs would appear in the middle of volume 30. They would for the most part be wiped out by an asteroid on page 385. Only the last 65 pages of the

last volume would have anything to say of significance about mammals like the cat. The last ancestor of both us and our nearest living relative, the chimp, would have lived and died only page 443 of the most recent volume, 17 million years age. From that ancestor many other ancestral hominoid species would follow, each coming and going in the last 10 pages.

On the last tenth of the last page of that last volume humans would have a note about our emergence in Africa. And then, somewhere toward the last sentence would be the emergence of language, texts, and, in that mental world, thoughts and imaginary creatures like Alice in Wonderland.

18. According to the passage, which of the following is true?

   ① Dinosaurs did not appear in the last volume.
   ② The emergence of the land from sea is described at the end of volume 29.
   ③ Bacteria began to change the planet's atmosphere at the end of volume 24.
   ④ It is in volume 29 that the first forms of animal life appeared on land.

19. Why does the author compare the history universe to the books in thirty volumes?

   ① To present the prevailing cosmological model for the universe
   ② To explain how short the histories of living things and humans are
   ③ To show the thirty important phases of the evolvement of the universe
   ④ To give an example of how the universe is begun and formed

20. Which of the following is most likely to be inferred from the passage?

   ① Both DNA sequence and fossil evidence provide a piece of information on bacterial photosynthesis.
   ② Paramecium is one of the early forms of animal life.
   ③ The last ancestor of the cat and dinosaurs lived together for a moment.
   ④ Alice in Wonderland has something to do with our ancestral hominoid species.

<center>(수학: 다음 페이지에)</center>

수 학 (21-30)

21. 수열 $\{a_n\}$의 처음 n개 항의 합 $S_n = \sum_{k=1}^{n} a_k$이 n에 대한 2차식이고, $\lim_{n \to \infty} \dfrac{a_n}{n} = 2$ 이 성립할 때 $\lim_{n \to \infty} \dfrac{S_n}{n^2}$의 값을 구하시오.

① 1　　　　② 2　　　　③ 3　　　　④ 4

22. 함수 $f(x) = x^3 - 6x^2 + 9x + a$가 실근을 두 개 이상 가지도록 하는 정수 a의 개수를 구하시오.

① 3　　　　② 4　　　　③ 5　　　　④ 6

23. 미분가능한 함수 $f(x)$가 모든 실수 a, b에 대해서 $f(a+b) = f(a) + f(b) + ab$, $\lim_{x \to 0} \dfrac{f(x)}{x} = 2$를 만족할 때 $f(1)$의 값을 구하시오.

① $\dfrac{1}{2}$　　　② $\dfrac{3}{2}$　　　③ $\dfrac{5}{2}$　　　④ $\dfrac{7}{2}$

24. 함수 $f(x) = \begin{cases} x^2 - 2ax + 3b & (x < 1) \\ ax + b & (x \geq 1) \end{cases}$ 가 $x = 1$에서 미분가능할 때 ab의 값을 구하시오.

① $\dfrac{1}{4}$　　　② $\dfrac{1}{3}$　　　③ $\dfrac{1}{2}$　　　④ 1

25. 함수 $f(x)$가 $f(x) = f\left(\dfrac{1}{x}\right)$을 만족한다.
$g(x) = f(2^x)$이고 $\displaystyle\int_0^1 g(x)dx = 2$, $\displaystyle\int_1^2 g(x)dx = 3$, $\displaystyle\int_2^3 g(x)dx = 5$가 성립할 때 $\displaystyle\int_{-2}^3 g(x)dx$의 값을 구하시오.

① 5　　　　② 8　　　　③ 10　　　④ 15

26. 다항함수 $f(x)$가 $\displaystyle\int_0^x tf(t)dt = x^3 \int_1^2 f(t)dt + x^2$을 만족할 때 $f(7)$을 구하시오.

① -10　　② -5　　③ $\dfrac{49}{4}$　　④ 10

27. $\displaystyle\sum_{n=1}^{\infty} n\left(a_n + \dfrac{2}{\sqrt{n^2+3}}\right) = 3$, $\displaystyle\sum_{n=1}^{\infty} \dfrac{1}{n^2}\left(b_n + \dfrac{n^4}{2n^2+1}\right) = 5$ 일 때 $\lim_{n \to \infty} \dfrac{a_n b_n}{n}$의 값을 구하시오.

① -2　　② -1　　③ 1　　④ 2

28. 함수 $f(x) = x^3 + ax^2 + bx + c$가 서로 다른 세 실근 α, β, γ를 갖는다. 이산확률변수 X의 값이 α, β, γ일 확률이 각각 $\dfrac{1}{3}$이고 X의 평균이 0, 표준편차가 1일 때 $f'(x)$의 최솟값을 구하시오.

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

29. 앞면에는 1, 뒷면에는 2가 새겨진 동전을 두 번 던져서 처음 나온 값을 a, 두 번째 나온 값을 b라 하자. $\dfrac{b}{a}$의 값을 확률변수 X, $\dfrac{a}{b}$의 값을 확률변수 Y라 할 때 다음 설명 중 옳은 것을 모두 고르시오.

> a. X와 Y의 평균은 같다.
> b. X의 평균은 $\dfrac{9}{8}$이다.
> c. Y의 평균은 1이다.

① a　　　② a, b　　　③ a, c　　　④ b, c

30. 홍대 앞 맥주집의 생맥주 500ml 한 잔에 담긴 양은 표준편차 5ml인 정규분포를 따른다고 한다. 생맥주 한 잔에 담긴 맥주의 평균 부피를 신뢰도 95%로 추정할 때, 신뢰구간의 길이를 2 이하로 하려면 최소 몇 잔 이상 조사해야 하는지 구하시오.

    ① 91   ② 93   ③ 95   ④ 97

<표준정규분포표>

z	$P(0 \leq Z \leq z)$
0.49	0.1879
0.98	0.3365
1.47	0.4292
1.96	0.4750