

2013학년도 송실대학교 편입학 시험 문제



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2013학년도 숭실대학교 편입학 시험 문제(자연계)

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문항배점 : [1-9, 26-35] 1.5점 / [10-16, 36-40] 2점 / [17-25, 41-50] 2.5점

[1-2] Choose the one that is grammatically NOT correct.
(각 1.5점)

- [1] A bomb struck the Qasioun gas station in the northeastern Damascus neighborhood of Barzeh, ① killing and ② wounding many people, the government news agency SANA ③ reporting, ④ blaming terrorists, its shorthand for its opponents.
- [2] Around 5:20 a.m. ① in New Year's Day, the police said, a woman believed to be ② in her 20s lay down on the tracks ③ at West 34th Street and was killed ④ by a northbound No. 2 train.

[3-9] Choose the expression that is closest in meaning to the underlined part. (각 1.5점)

- [3] The Philippine government appears ready to throw in the towel on efforts to find the billions in national wealth squirreled away by late Philippine strongman Ferdinand Marcos.
① get back ② give in ③ make it ④ set out
- [4] "We budgeted \$600 for all our family and friends, and we stuck with that," said Wendy Estrada, 33, of Pasadena. "It wasn't the right time to go over the top."
① overspend ② stand out
③ take a stand ④ climb the mountain
- [5] That is why one of the biggest antitrust investigations of an American company in years ended with a slap on the wrist Thursday, when the Federal Trade Commission closed its investigation of Google's search practices without bringing a complaint.
① a slap on the back ② a slap in the face
③ a severe punishment ④ a soft punishment
- [6] For Romanticism, the symbol becomes the panacea for all problems. Within it, a whole set of conflicts which were felt to be insoluble in ordinary life--between subject and object, the universal and the particular, material and spiritual--could be magically resolved.
① unable to liquidate ② unable to be liquefied
③ incapable of solving ④ incapable of solution
- [7] Ohthere was not the only Viking merchant who catered to the European appetite for fine goods from the frozen north.
① enjoyed ② improved ③ provided ④ upheld
- [8] The ecstatic trance, or soul journey, as it's sometimes called, is a signature phenomenon.
① distinctive ② hand-writing ③ religious ④ significant
- [9] This rule is leaps and bounds better than what we have now.
① almost ② by far ③ superficially ④ unexpectedly

[10-16] Choose the most appropriate word for each blank.
(각 2점)

- [10] A decade ago, Eric Swalwell was working at a Capitol Hill gym handing out towels to members of Congress. On Thursday, he was on the House floor, _____ to support and defend the Constitution as one of 14 new House members from California.
① scorning ② sentencing ③ swearing ④ swerving
- [11] In 2012, 55 people died after being hit by subway trains in New York, an increase of eight deaths compared with 2011. This year has already begun on a _____ note.
① dismal ② high ③ optimistic ④ terrific

[12] Anti-government activists said the explosion was caused by a bomb in a car or minibus, and they put the death _____ between 9 and 11, adding that it could rise because many were in critical condition.

- ① rate ② toll ③ threats ④ row

[13] In a matter of a few years, tablets went from nice-to-have to must-have _____ this year. They're the way everyone--from kids to seniors--wants to watch TV shows, check email, play games and browse the Internet.

- ① apps ② gadgets ③ movies ④ programs

[14] Vast stands of timber were consumed; numberless herds of buffalo and other game _____ cattle, sheep, farms, villages, and cities; various technologies converted the country's immense natural resources into industrial products.

- ① gave way to ② gave away to
③ got in the way to ④ got away with

[15] Food safety is a top concern for Chinese shoppers, especially regarding such _____ as vegetables, meat, seafood, grain, cooking oils and dairy goods, according to a report from Ipsos.

- ① produce ② product ③ salads ④ valuables

[16] Americans were forced to _____ with the implications of Darwin's theory of evolution as well as with profound changes in its own social institutions and cultural values.

- ① come away ② come down ③ come to terms ④ come up

[17-19] Read the following passage and answer the questions. (각 2.5점)

In its simplest form, the question of Black-White speech relations can be reduced to a question of whether vernacular* African American and European American varieties share the same set of linguistic structures. Are there unique features that distinguish vernacular varieties of AAE (African American English) from comparable European American vernacular varieties in the same regional setting, and if so, what are they?

The matter of the linguistic distinctiveness of speakers of AAE is both simple and complex. Given a randomly selected set of audio recordings whose content contains no culturally identifying material, listeners can accurately identify African American speakers approximately 80 percent of the time. Determining the basis of this identification, however, is not nearly as straightforward as making the categorizations. Linguistically, different levels of language organization may be involved, ranging from minute strategies to conversational routines. Socially, factors such as listeners' social status, region, and level of education affect their perceptions of ethnic identity, as do interactional factors such as speakers' co-conversationalists and the speech setting. All of these factors enter into ethnic identification based on language, and manipulating the array of linguistic, social, and personal variables in identification experiments greatly affects the likelihood of accurate ethnic identification. Thus, the ethnicity of some African American speakers in certain contexts may be identified correctly less than 5 percent of the time while other speakers are correctly identified more than 95 percent of the time.

Region and status, along with various other sociocultural attributes, are also important factors in considering structural similarities and differences in African American and European

American vernacular varieties. Because AAE is historically rooted in a Southern-based, rural working-class variety, researchers often seek to answer questions of dialectal uniqueness by comparing vernacular AAE with rural Southern European American vernacular varieties. At the same time, the development of AAE into a recognized sociocultural variety in the twentieth century became strongly associated with its use in urban areas in the North.

* vernacular: the language or dialect that is most widely spoken by ordinary people in a region.

[17] How accurately can we normally identify the ethnicity of African American speakers?

- ① less than 5% of the time ② about half of the time
③ about 80% of the time ④ more than 95% of the time

[18] Which of the following has NOT affected the formation of African American English?

- ① Northern urban life ② Southern rural experience
③ working-class life ④ frontier experience in the West

[19] Which of the following is NOT true?

- ① Who we speak to affects identification of speakers.
② African American speakers use the same variety of English.
③ The setting in which we talk affects identification of speakers.
④ Identifying the speaker is easier than determining the basis of identification.

[20-22] Read the following passage and answer the questions. (각 2.5점)

When we remember our past selves, they seem quite different. We know how much our personalities and tastes have changed over the years. But when we look ahead, somehow we expect ourselves to stay the same, a team of psychologists said Thursday, describing research they conducted of people's self-perceptions.

They called this phenomenon the "end of history illusion," in which people tend to "underestimate how much they will change in the future." According to their research, which involved more than 19,000 people ages 18 to 68, the illusion persists from teenage years into retirement.

"Middle-aged people--like me--often look back on our teenage selves with some mixture of amusement and disappointment," said one of the authors, Daniel T. Gilbert, a psychologist at Harvard. "What we never seem to realize is that our future selves will look back and think the very same thing about us. At every age we think (1) we're having the last word, and at every age we're wrong."

Other psychologists said they were intrigued by the findings, published Thursday in the journal *Science*, and were impressed with the amount of supporting evidence. Participants were asked about their personality traits and preferences--their favorite foods, vacations, hobbies and bands--in years past and present, and then asked to make predictions for the future. Not surprisingly, the younger people in the study reported more change in the previous decade than did the older respondents.

But when asked to predict what their personalities and tastes would be like in 10 years, people of all ages consistently (2) _____ the potential changes ahead.

Thus, the typical 20-year-old woman's predictions for her next decade were not nearly as radical as the typical 30-year-old woman's recollection of how much she had changed in her 20s. This sort of discrepancy persisted among respondents all the way into their 60s.

[20] Which of the following best paraphrases (1)?

- ① Our future will never be the same.
② Our future will not change much.
③ The best is yet to come to our future.
④ We will be the ultimate winners of life.

[21] Which of the following fits best in (2)?

- ① fantasized about ② overestimated
③ worried about ④ played down

[22] According to the passage, which of the following is NOT true?

- ① It is easy to recall the past.
② It is hard to predict the future.
③ We remember both positive and negative parts of life.
④ Life will be almost the same after 50.

[23-25] Read the following passage and answer the questions. (각 2.5점)

If you're trying to (A1) lose weight--and (1) who isn't, right?--you may be confused about how to achieve the optimal balance of aerobic exercise and resistance training. Aerobic activity is supposed to burn lots of calories, but it can (B1) take a big chunk out of your day. (A2) Lifting weights or otherwise challenging your muscles is supposed to build lean mass, which, in turn, has been thought to accelerate calorie burning. Plus, it isn't quite as (B2) time-consuming as running, swimming, biking or other popular aerobic workouts. For those with plenty of time, a combination of the two would seem to be ideal.

At least, that's what we've been hearing for the past few years. The cardio/weight-training combo was central to my *Me Minus 10* weight-loss effort back in 2010. But a study published Saturday in the *Journal of Applied Physiology* suggests that, at least for middle-aged, overweight but basically healthy people, aerobic training alone delivers the biggest weight-loss bang for your (2) _____.

Researchers at Duke University divided (C1) 234 overweight or obese adult participants into three groups as follows: one group engaged in resistance training consisting of three days per week of weight lifting, three sets per day, 8-12 repetitions per set; another engaged in aerobic training, covering about 12 miles per week; a third group engaged in both kinds of activity. Full sets of final data were collected for just 119 of (C2) the initial participants.

(D1) Their physical activity was monitored to ensure participants were putting in similar amounts of time and effort. Dietary intake was estimated to be between an average of 2,000 and 2,100 calories per day.

After a four-week "run-up" period designed to weed out those who would likely drop out during the study period itself, all groups did (D2) their thing for eight weeks.

[23] Which of the following is implied by (1)?

- ① Some people never try to lose weight.
② Someone is trying to lose weight.
③ Everyone is trying to lose weight.
④ I am always curious about this.

[24] Which of the following fits best in (2)?

- ① buck ② efficiency ③ life ④ weight

[25] Which of the following sets does NOT mean or refer to the same thing?

- ① A1-A2 ② B1-B2 ③ C1-C2 ④ D1-D2

[26] $\lim_{h \rightarrow 0} \frac{\sin(x^2+h) - \sin(x^2)}{h}$ 을 바르게 계산한 것은? (1.5점)

- ① $\sin(x^2)$ ② $\cos(x^2)$ ③ $2x \cos(x^2)$ ④ $2x \sin(x^2)$

[27] 곡선 $y = x \ln x - x$ 위의 점 $(e, 0)$ 에서 접선의 방정식은? (1.5점)

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

[28] 함수 $f(x) = \frac{x^2 e^x}{1+x^{100}}$ 에 대하여 $f''(0)$ 의 값은? (1.5점)

- ① 1 ② 2 ③ 3 ④ 4

[29] 2013년 1월 18일 기온이 시간 t 에 대한 함수

$$T(t) = -t^3 + 3t - 1$$

로 주어질 때, 0시부터 3시 사이의 평균기온은? (1.5점)

- ① $-\frac{39}{4}$ ② $-\frac{15}{2}$ ③ $-\frac{13}{4}$ ④ $-\frac{5}{2}$

[30] 곡선 $r = 2(\cos \theta + \sin \theta)$ 의 길이는? (1.5점)

- ① π ② $\sqrt{2}\pi$ ③ 2π ④ $2\sqrt{2}\pi$

[31] 다음 곡면 중에서 제1팔분공간에 포함된 부분의 표면적이 유한하지 않은 것은? (1.5점)

- ① $x^2 - \frac{y^2}{4} + \frac{z^2}{3} = 1$ ② $\frac{x^2}{2} + \frac{y^2}{4} + \frac{z^2}{6} = 1$
③ $z = 10 - \frac{x^2}{4} - \frac{(y-1)^2}{9}$ ④ $4x + 2y + 9z = 4$

[32] 곡선 $y = x^2 - 3x$ 와 직선 $x = 0$, $x = 3$, $y = mx$ 로 둘러싸인 부분의 넓이가 x 축에 의해 이등분될 때, 상수 m 의 값은? (1.5점)

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

[33] 점 $(3, 1, 1)$ 에서 평면 $x - y + 2z = -2$ 에 내린 수선이 평면과 만나는 점은? (1.5점)

- ① $(4, 0, 3)$ ② $(1, 1, -1)$ ③ $(2, 2, -1)$ ④ $(0, 4, 1)$

[34] 세 점 $(4, 2, 0)$, $(4, -2, 0)$, $(0, 0, 2)$ 을 지나는 평면이 곡면 $y^2 + z^2 = 4$ 와 만날 때 생긴 교선 위의 점이 아닌 것은? (1.5점)

- ① $(8, 0, -2)$ ② $(4 - 2\sqrt{3}, 1, \sqrt{3})$
③ $(2, \sqrt{3}, 1)$ ④ $(4 - 2\sqrt{2}, \sqrt{2}, -\sqrt{2})$

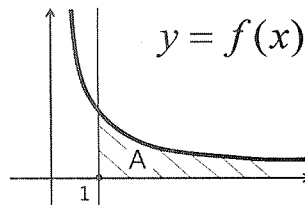
[35] 곡면 $z = x^2 - 2x + xe^y$ 위의 점 $(1, 0, 0)$ 에서의 접평면의 방정식은? (1.5점)

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

[36] 곡면 $f(x, y) = -x^2 + 4xy - 5y^2 - 2y - 1$ 위의 점 $(-2, 1, -20)$ 에 구슬을 놓았을 때, 이 구슬이 굴러갈 방향의 벡터는? (2.0점)

- ① $\langle -2, 1 \rangle$ ② $\langle 1, 2 \rangle$ ③ $\langle 5, 2 \rangle$ ④ $\langle 2, -5 \rangle$

[37] A 는 $y = f(x)$, $x = 1$, $y = 0$ 로 둘러싸인 영역이고 (아래 그림 참조), B 는 A 를 x 축을 회전축으로 하여 회전시켜 만든 회전체이다.



이때, A 의 넓이는 무한이고, B 의 부피가 유한인 경우의 함수는? (2.0점)

- ① $f(x) = x^{-\frac{3}{8}}$ ② $f(x) = x^{-\frac{3}{4}}$ ③ $f(x) = x^{-\frac{3}{2}}$ ④ $f(x) = x^{-3}$

[38] 다음 중 조건부수렴하는 급수의 개수는? (2.0점)

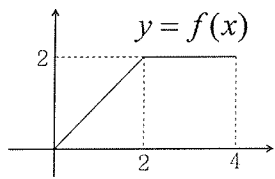
$$\sum_{n=1}^{\infty} \frac{(-1)^n}{3n-1}, \quad \sum_{n=1}^{\infty} \frac{(-1)^n n^3}{2^n}, \quad \sum_{n=1}^{\infty} \frac{(-1)^n 2^{2n}}{3^{n+8}}, \quad \sum_{n=1}^{\infty} \frac{(-1)^n \sqrt{2}}{\ln n}$$

- ① 1 ② 2 ③ 3 ④ 4

[39] 함수 $f(x) = 4 \sinh^{-1} x$ 에서 $a = \sinh \frac{a}{4}$ 일 때, $f'(a)$ 의 값은? (2.0점)

- ① $\frac{1}{4} \sinh \frac{a}{4}$ ② $\frac{1}{4} \cosh \frac{a}{4}$ ③ $\frac{4}{\sinh \frac{a}{4}}$ ④ $\frac{4}{\cosh \frac{a}{4}}$

[40] 함수 $f(x)$ 의 그래프가 다음과 같이 주어져 있다.



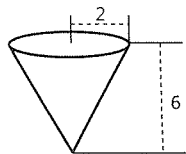
새로운 함수 $g(x) = x \int_0^x f(t)dt$ 에 대하여 $\frac{dg}{dx}(2)$ 의 값은? (2.0점)

- ① 2 ② 4 ③ 6 ④ 8

[41] 변수 x, y 가 매개변수 t 로 표현되어 있다. 함수 $f(t) = \frac{dy}{dx}$ 일 때, $\frac{df}{dt}$ 를 바르게 구한 것은? (2.5점)

- ① $\frac{d^2y}{dx^2}$ ② $\frac{d^2y}{dx^2} \frac{dx}{dt}$ ③ $\frac{d^2x}{dt^2} \frac{dy}{dt}$ ④ $\frac{d^2y}{dt^2} / \frac{d^2x}{dt^2}$

[42] 반지름 2m, 높이 6m인 원뿔형 물탱크가 있다.



비어있는 탱크에 $\pi \text{ m}^3/\text{hour}$ 의 속도로 물을 채우기 시작하여 1시간이 지났을 때 수면 높이의 변화율은? (2.5점)

- ① 1m/hour ② 4m/hour ③ 9m/hour ④ 16m/hour

[43] 함수 $f(x) = 2x^2 - 3x$ 에 대하여 $F(x) = \int_0^{f(x)} f(t)dt$ 라 정의할 때, $\frac{dF}{dx}(1)$ 의 값은? (2.5점)

- ① $f(1)f'(1)$ ② $(f'(1))^2$ ③ $f'(1)f'(-1)$ ④ $f(-1)f'(1)$

[44] $\int_0^1 \int_0^1 \frac{2y}{1+x^2} dx dy$ 와 다른 값을 갖는 이중적분은? (2.5점)

- ① $\int_0^{-1} \int_0^1 \frac{2y}{1+x^2} dx dy$ ② $\int_0^1 \int_0^{-1} \frac{2y}{1+x^2} dx dy$
 ③ $\int_0^1 \int_0^1 \frac{2y}{1+(1-x)^2} dx dy$ ④ $\int_0^1 \int_0^1 \frac{2(1-y)}{1+x^2} dx dy$

[45] 함수 $f(x) = \sqrt{1+x^2} + \sqrt{1-x^2}$ 에서 $f^{(4)}(0)$ 의 값은? (2.5점)

- ① -6 ② -3 ③ 0 ④ 3

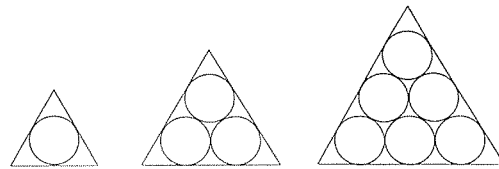
[46] $L(n) = \sum_{k=0}^{n-1} \left(\frac{k}{n}\right)^{\frac{1}{2}} \frac{1}{n}$, $R(n) = \sum_{k=1}^n \left(\frac{k}{n}\right)^{\frac{1}{2}} \frac{1}{n}$, $T(n) = \frac{L(n)+R(n)}{2}$ 라 정의할 때, 다음 부등식 중 옳은 것은? (2.5점)

- ① $L(n) \leq \int_0^1 x^{\frac{1}{2}} dx \leq T(n) \leq R(n)$
 ② $L(n) \leq T(n) \leq \int_0^1 x^{\frac{1}{2}} dx \leq R(n)$
 ③ $R(n) \leq \int_0^1 x^{\frac{1}{2}} dx \leq T(n) \leq L(n)$
 ④ $R(n) \leq T(n) \leq \int_0^1 x^{\frac{1}{2}} dx \leq L(n)$

[47] A 는 $y = \sin x$, $y = 0$, $x = \pi/2$ 로 둘러싸인 영역이고, B 는 $y = x$, $y = 0$, $x = \pi/2$ 로 둘러싸인 영역이다. 이를 각각 x 축, y 축을 회전축으로 하여 회전시켜 만들어지는 입체를 각각 A_x , A_y , B_x , B_y 라 하자. 이때 가장 부피가 큰 입체는? (2.5점)

- ① A_x ② A_y ③ B_x ④ B_y

[48] 반지름이 1인 원을 $1+2+3+\dots+n = n(n+1)/2$ 개 포함하는 정삼각형을 생각하자. 예를 들어, 아래의 그림은 $n=1, 2, 3$ 일 때의 모양이다.



A_n 을 n 번째 정삼각형 내의 모든 원의 넓이의 합, B_n 을 n 번째 정삼각형의 넓이라고 할 때, $\lim_{n \rightarrow \infty} A_n/B_n$ 의 값은? (2.5점)

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

[49] 함수 $g(x)$ 는 다음 조건을 만족하는 미분가능한 함수이다.

$$g(x) = g'(x) + x \cosh x$$

이때, 함수 $f(x) = g(x)e^{-x}$ 가 $x=0$ 에서 갖는 성질은? (2.5점)

- ① $f(x)$ 가 $x=0$ 에서 극대값을 갖는다.
 ② $f(x)$ 가 $x=0$ 에서 극소값을 갖는다.
 ③ $(0, f(0))$ 은 변곡점이다.
 ④ $(0, f(0))$ 은 극대점, 극소점, 변곡점이 모두 아니다.

[50] 두 직선 $L_1: \frac{x-5}{2} = y-1 = z+2$, $L_2: x+3 = y+2 = \frac{z-4}{2}$

사이에 있는 평면의 방정식은? (2.5점)

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