

2016학년도
아주대학교 편입학 수강능력시험

자연계 A형



성명	
전형	
수험번호	

Questions 1-5: Choose the one word or phrase that best completes the sentence.

1. (0.8 points) The higher we soar, _____ to those who cannot fly.

- ① the small we appear
- ② the high we appear
- ③ the smaller we appear
- ④ the higher do we appear
- ⑤ the less smaller do we appear

2. (0.8 points) No book is worth anything which is not worth much; _____, until it has been read, and re-read, and loved, and loved again, and marked; so that you can refer to the passages you want in it.

- ① Nor it is serviceable
- ② Nor is it serviceable
- ③ None it be serviceable
- ④ Neither it be serviceable
- ⑤ Neither be it serviceable

3. (1.0 points) The cybernetic revolution has developed more rapidly than _____

- ① foresaw several years ago
- ② foreseen several years ago
- ③ had foreseen several years ago
- ④ none have foreseen several years ago
- ⑤ many could have foreseen several years ago.

4. (0.8 points) _____ has been put on earth with the ability to do something well. We cheat ourselves and the world if we don't use that ability as best we can.

- ① All of us
- ② Any of us
- ③ Each of us
- ④ Neither of us
- ⑤ None of us

5. (1.0 points) We have a responsibility toward the other life-forms of our planet _____ the thoughtless behavior of our own human species.

- ① whose continued existence is threatened by
- ② which continued existence is threatening by
- ③ of their continuing existence is threaten by
- ④ of whose continuing existence is threatened by
- ⑤ their continuing existence of which is threatening by

Questions 6-10: Choose the underlined word or phrase that must be changed for the sentence to be correct.

6. (0.8 points) ① Just as treasures are uncovered from the earth, ② then virtue appears from good deeds, and wisdom ③ emerges from a pure and peaceful mind. To walk ④ safely through the maze of human life, ⑤ one needs the light of wisdom and the guidance of virtue.

7. (0.8 points) ① Convicting for stealing a loaf of ② bread for his sister's ③ starving children, Jean Valjean ④ was sentenced to five years of hard labor and ⑤ another fourteen years for attempting to escape.

8. (1.0 points) The most fundamental questions of ① what humans came to be the kind of animal ② we are can only be answered by a theory ③ in which culture has its proper role and ④ in which it is intimately ⑤ intertwined with other aspects of biology.

9. (0.8 points) Ebola, a ① highly infectious virus ② that can kill up to 90 ③ percent of the people who catch it, is one of the ④ world most deadly diseases, ⑤ causing terror among infected communities.

10. (1.0 points) ① Almost orders ship within 3 to 5 business days of purchase. Shipping times may ② vary due to availability of merchandise. ③ Should you change or cancel your order, please contact us immediately. ④ Once the parcel was sent to the post office, we will be unable to make ⑤ any changes.

Questions 11-12: Choose the number with a correct set of statements that can be restated or inferred from the original sentence. (1.2 pt for each question)

11. Such serious mental disorders as mania, schizophrenia, and severe depression are two to three times more common among men in jails than among men in the general population.

- (a) Most of men in jails are vulnerable to serious mental disorders.
- (b) Individuals with serious mental disorders are more frequently placed in jail than people in the general population.
- (c) There are more men in jails who have certain mental disorders than there are men in the general population with those disorders.
- (d) There is a direct relationship between individuals' mental disorders and the anti-social behaviors that may have caused imprisonment.

- ① (a) & (b)
- ② (a) & (c)
- ③ (b) & (c)
- ④ (b) & (d)
- ⑤ (b), (c) & (d)

12. Imagine the worst time with lack of sleep you have ever had after staying up all night to study for an exam; then imagine your worst-ever case of flu; that combination and then some is what chronic fatigue syndrome (CFS) feels like on a "normal" day.

- (a) Patients with CFS suffer from sleeplessness.
- (b) Suffering from CFS is by far worse than having the flu.
- (c) CFS is typically accompanied by characteristic symptoms of a flu.
- (d) If you have a severe case of flu, you have a higher risk of having CFS.

- ① (a) & (c)
- ② (a) & (d)
- ③ (b) & (c)
- ④ (b) & (d)
- ⑤ (a), (b) & (c)

Questions 13-25: Read each passage and answer the corresponding questions for each.

※ Questions 13 through 15 are based on the following passage.

[A] We create our own images when reading, based upon our own life experiences and reflecting our own individual needs, while we must accept what we receive when watching television images. This aspect of reading, which might be called “creative” in its narrow sense, is present during all reading experiences, regardless of what is being read. The reader “creates” his own images as he reads, almost as if he were creating his own, inner television program. ❶ As Bruno Bettelheim notes, “television captures the imagination but does not liberate it. A good book at once stimulates and frees the mind.”

[B] Because reading demands complex mental manipulations, a reader is required to concentrate far more than a television viewer. An audio expert notes that “someone who is taught to concentrate will fail to perceive many patterns of information conveyed by the electronic stimuli.” ❷ It may be that a predisposition toward concentration, acquired, through one’s reading experiences, makes one an inadequate television watcher. But it seems far more likely that the reverse situation obtains: that a predisposition toward “openness,” acquired through years of television viewing, has influenced adversely viewers’ ability to concentrate, to read, to write clearly. ❸

[C] The pace of reading, clearly, depends entirely upon the reader. He may read as slowly or as rapidly as he can or wishes to read. If he does not understand something, he may stop and reread it, or go in search of elucidation before continuing. ❹ The reader can accelerate his pace when the material is easy or less than interesting, and slow down when it is difficult or enthralling. If what he reads is moving, he can put down the book for a few moments and cope with his emotions without fear of losing anything.

[D] The pace of the television experience cannot be controlled by the viewer. He cannot slow down a delightful program or speed up a dreary one. Nor can he transform the material he receives into a form that might suit his particular emotional needs, as he invariably does with material he reads. The images move too quickly. ❺ They flash from the television set just fast enough for the eyes and ears to take them in before moving on quickly to the new pictures and sounds so as not to lose the thread.

13. (0.8 points) Which types of patterns did the writer use in the above?

- ① cause and effect
- ② comparison and contrast
- ③ a list of ideas with supporting details
- ④ a process sequence of events by time
- ⑤ a solution to problems within a context

14. (1.2 points) The following is removed from the passage. In which parts **① - ⑤** may it be inserted to support the argument made by the author?

He cannot use his own imagination to invest the people and events portrayed on television with the personal meanings that would help him understand and resolve relationships and conflicts in his own life; he is under the power of the imagination of the show' s creators. In the television experience the eyes and ears are overwhelmed with the immediacy of sights and sounds.

- ① **①**
- ② **②**
- ③ **③**
- ④ **④**
- ⑤ **⑤**

15. (1.2 points) Which of the following is TRUE about the passage above?

- ① TV viewing gives stronger visual images due to concentration.
- ② TV viewer can modify the material to cope with his emotions.
- ③ TV viewers are also capable of creative inner-picture making process.
- ④ TV viewing exerts a negative influence on one' s ability to concentrate.
- ⑤ TV viewing accelerates the speed of perceiving many patterns of information conveyed by the electronic stimuli.

※ Questions 16 through 18 are based on the following passage.

[A] Modern European and American history is centered around the effort to gain freedom from the political, economic, and spiritual shackles that have bound men. The battles for freedom were fought by the oppressed, those who wanted new liberties, against those who had privileges to defend. While a class was fighting for its own liberation from domination, it believed itself to be fighting for human freedom as such and thus was able to appeal to an ideal, to the longing for freedom rooted in all who are oppressed. In the long and continuous battle for freedom, however, classes that were fighting against oppression at one stage sided with the enemies of freedom when victory was won and new privileges were to be defended.

[B] Despite many reverses, freedom has won battles. Many died in those battles in the conviction that to die in the struggle against oppression was better than to live without freedom. Such a death was the utmost assertion of their individuality. History seemed to be proving that it was possible for man to govern himself, to make decisions for himself, and to think and feel as he saw fit. The full expression of man's potentialities seemed to be the goal toward which social development was rapid approaching. The principles of economic liberalism, political democracy, religious autonomy, and individualism in personal life, gave expression to the longing for freedom, and at the same time seemed to bring mankind nearer to its realization. One tie after another was (a) severed. Man had overthrown the domination of nature and made himself her master; he had overthrown the domination of the Church and the domination of the absolutist state. The abolition of external domination seemed to be not only a necessary but also a sufficient condition to attain the cherished goal: (b) _____ .

16. (1.2 point) What does the above passage mainly discuss?

- ① The goal and nature of battles for freedom
- ② The illusion of arguments for human freedom
- ③ The ambiguity in the meaning of human freedom
- ④ The necessary and sufficient conditions for freedom
- ⑤ The history of freedom fights in Europe and America

17. (0.8 point) Which of the following can the underlined word **(a) severed** in paragraph [B] be best replaced with?

- ① enhanced
- ② conjoined
- ③ intensified
- ④ discontinued
- ⑤ substantiated

18. (1.2 points) Which phrase best fits the blank **(b)** in paragraph [B]?

- ① freedom of the society
- ② freedom of the individual
- ③ defense for human privileges
- ④ abolition of external domination
- ⑤ domination of the supreme state

※ Questions 19 through 22 are based on the following passage.

[A] Bonobos are one of humankind's closest living relatives. These great apes are complex creatures with profound intelligence, emotional expression, and sensitivity. Bonobo communities are peace-loving and egalitarian. They have a (a)_____ society, where females have a higher social status than males and social interactions are female-oriented. Females have strong social bonds among themselves, but they do not exclude males. Like human society, sex transcends reproduction, serves to promote bonding, reduce tensions and share pleasure. Because of their caring and compassionate society, bonobos serve as a powerful symbol of peace and cooperation.

[B] Observations in the wild, however, indicate that mate competition by males over females is common in many animal species. The males among the related common chimpanzee communities are, in fact, extraordinarily hostile to males from outside the community. Parties of males 'patrol' for the neighboring males that might be traveling alone, and attack those males, often killing them. This does not appear to be the behavior of bonobo males or females, which seem to prefer sexual contact over violent confrontation with outsiders.

[C] The scientists who have spent the most time working with wild bonobos describe the species as extraordinarily peaceful, and they may often resolve conflicts with sexual contact. Between groups, social mingling may occur, in which members of different communities have sex and groom each other, behavior which is unheard of among common chimpanzees. The ranges of bonobos and chimpanzees are separated by the Congo River, with bonobos living to the south of it, and chimpanzees to the north. The hypothesis is that bonobos are able to live a more peaceful lifestyle in part because of an abundance of nutritious vegetation in their natural habitat, allowing them to travel and forage in large parties.

[D] Biological research indicates that the empathic nature of bonobos has its attribution to the brain structure. The brain anatomy of bonobos has more developed and larger regions assumed to be vital for feeling empathy and sensing distress in others, which makes them (b)_____. They also have a thick connection between the amygdala, an important area that can spark aggression, and the cingulate cortex, which helps control impulses. This thicker connection may make them better at regulating their emotional impulses and behavior.

19. (1.2 points) What is the best title for the above passage?

- ① The habitat and range of bonobos
- ② The physical characteristics of bonobos
- ③ The behavior and social structure of bonobos
- ④ The differences between bonobos and chimpanzees
- ⑤ The similarities between bonobos and human beings

20. (0.8 points) Which of the following can best fill in the blank (a)?

- ① matriarchal
- ② matrimonial
- ③ hierarchal
- ④ patriarchal
- ⑤ patrimonial

21. (0.8 points) In paragraph [D], which of the following would best fit in the blank (b)?

- ① less aggressive and compassionate than their close relatives
- ② more aggressive and compassionate than their close relatives.
- ③ less aggressive and more compassionate than their close relatives.
- ④ more aggressive and less compassionate than their close relatives.
- ⑤ more or less aggressive and compassionate than their close relatives.

22. (1.2 points) According to the passage, which of the following is NOT true?

- ① Bonobos are among the closest living relatives of humans.
- ② Bonobos are unique and exceptional among the chimpanzee groups.
- ③ The chimpanzees are quite hostile to the members outside their communities.
- ④ Competative and masculine features are dominant in the world of chimpanzees.
- ⑤ Bonobos are less diverse in their social and sexual interactions compared to common types of chimpanzees.

※ Questions 23 through 25 are based on the following passage.

[A] The atmosphere is divided into five layers. It is thickest near the surface and thins out with height until it eventually merges with space. Ozone is found in the two different parts of the Earth's atmosphere: the troposphere and the stratosphere. The former is ground level ozone, a human health irritant and component of smog, while the latter accounts for the vast majority of atmospheric ozone that protects human health as it absorbs ultraviolet radiation from the sun, thereby preventing the radiation from hitting Earth's surface and harming living organisms from this biologically dangerous radiation. ❶

[B] The term 'ozone hole' refers to recent depletion of this protective layer of stratospheric ozone over the polar regions. People, plants, and animals living under the ozone hole are harmed by the solar radiation now reaching the Earth's surface—where it causes health problems from eye damage to skin cancer. ❷

[C] Scientists discovered that the ozone layer was thinning in the lower stratosphere, with particularly dramatic ozone loss—known as the ozone hole—in the Antarctic springtime. This is caused by increasing concentrations of ozone-depleting chemicals in the stratosphere, called chlorofluorocarbons or CFCs, which remain in the atmosphere for decades to over a century. When the sun comes out again in the polar spring, the ice particles melt, releasing the ozone-depleting molecules which in turn do their dirty work, breaking apart the molecular bonds in ultraviolet radiation-absorbing ozone. ❸

[C] The ozone hole, however, is not the mechanism of global warming. Ultraviolet radiation represents less than one percent of the energy from the sun—not enough to be the cause of the excess heat from human activities. Global warming is caused primarily from putting too much carbon into the atmosphere when coal and oil are burned to generate electricity or to run our cars. These gases spread around the planet like a blanket, capturing the solar heat that would otherwise be radiated out into space. ❹

[D] Both of these environmental problems do, however, have a common cause—human activities that release gases into and alter the atmosphere. Ozone depletion occurs when CFCs—formerly found in aerosol spray cans and refrigerants—are released into the atmosphere. These gases, through several chemical reactions, cause the ozone molecules to break down, reducing ozone's ultraviolet radiation-absorbing capacity. ❺

23. (1.2 points) Which of the following questions is **NOT** answered in the passage ?

- ① What is the ozone hole?
- ② What causes the ozone hole?
- ③ How does the ozone hole influence people?
- ④ How does the ozone hole contribute to global warming?
- ⑤ Does climate change have an impact on the stratospheric ozone layer?

24. (1.2 points) The following is removed from the passage. In which parts **① - ⑤** may it be inserted to support the argument made by the author?

Because our atmosphere is one connected system, it is not surprising that ozone depletion and global warming are related in some other ways. For example, evidence suggests that climate change may contribute to thinning of the protective ozone layer.

- ① **①**
- ② **②**
- ③ **③**
- ④ **④**
- ⑤ **⑤**

25. (1.2 points) According to the passage, which of the following is **NOT** true?

- ① The “ozone hole” in the troposphere do harm to people and animals.
- ② Ozone depleting molecules are released from the ice particle due to global warming.
- ③ CFCs, a human-developed compound, are quite destructive and long-lived in the atmosphere.
- ④ The thickness of the polar stratospheric ozone layer represents the intact function of its protection by the atmosphere.
- ⑤ As carbon chemicals and other heat-trapping gases rise into the atmosphere, spread around the globe, and act like a blanket holding in heat around Earth.

※ (문제 26 - 50) 다음 물음에 답하라.

[26] $\cos\left(2\sin^{-1}\left(\frac{3}{5}\right)\right)$ 의 값은?

- ① $-\frac{7}{25}$ ② $\frac{7}{25}$ ③ $-\frac{9}{25}$ ④ $\frac{9}{25}$ ⑤ $-\frac{2}{5}$

[27] $2\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right)$ 의 값은?

- ① $\frac{\pi}{12}$ ② $\frac{\pi}{8}$ ③ $\frac{\pi}{6}$ ④ $\frac{\pi}{4}$ ⑤ $\frac{\pi}{3}$

[28] 곡선 $x^3 + y^3 = 7$ 위의 점 $(-1, 2)$ 에서의 $\frac{d^2y}{dx^2}$ 을 구하면?

- ① $-\frac{5}{16}$ ② $-\frac{7}{16}$ ③ $-\frac{9}{16}$ ④ $\frac{5}{16}$ ⑤ $\frac{7}{16}$

[29] 실수 전체에서 정의된 미분가능 함수 $f(x)$ 가 아래 표에 나타난 값을 가진다.

x	-2	-1	0	1	2
$f(x)$	-8.5	-1	-0.5	0.25	2.5
$f'(x)$	12	3	0	0.5	2

함수 $g(x) = \sqrt{x^3 - 3f(x)}$ 의 $x = 1$ 에서의 일차근사함수를 이용하여 $g(1.1)$ 의 근삿값을 구하면?

- ① 0.65 ② 0.68 ③ 0.7
④ 0.72 ⑤ 0.75

[30] 어떤 물체가 곡선 $y = \sqrt{1+x^3}$ 위에서 움직이고 있다. 점 $(2, 3)$ 을 지나는 순간 y 좌표가 4 m/s의 속력으로 움직이고 있을 때 x 좌표의 속력은?

- ① 0.5 m/s ② 1 m/s ③ 2 m/s
④ 3 m/s ⑤ 4 m/s

[36] $\int_0^1 \frac{x+7}{x^2+4x+3} dx$ 의 값은?

- ① $2\ln 3 - \ln 2$ ② $2\ln 3 - 2\ln 2$ ③ $3\ln 3 - 2\ln 2$
 ④ $3\ln 3 - \ln 2$ ⑤ $3\ln 2 - \ln 3$

[37] 영역 $\{(x,y) : x^2 \sin(x^2) \leq y \leq \sin(x^2), 0 \leq x \leq \frac{\pi}{2}\}$ 의 y 축 둘레로 회전시킨 회전체의 부피는?

- ① π ② $\pi \sin 1$ ③ $\pi(1 - \sin 1)$
 ④ $\pi \cos 1$ ⑤ $\pi(1 - \cos 1)$

[38] 곡선 $y = \int_1^x \sqrt{\sqrt{t}-1} dt$ ($1 \leq x \leq 16$)의 길이는?

- ① $\frac{124}{5}$ ② $\frac{124}{3}$ ③ $\frac{128}{5}$
 ④ $\frac{128}{3}$ ⑤ $\frac{60}{3}$

[39] 정적분 $\int_2^3 \frac{dx}{\sqrt{4x-x^2}}$ 의 값은?

- ① $\frac{\pi}{6}$ ② $\frac{\pi}{4}$ ③ $\frac{\pi}{3}$
 ④ $\frac{\pi}{2}$ ⑤ π

[40] 영역 $\{(x,y) : 0 \leq y \leq \sin^2 x, 0 \leq x \leq \frac{\pi}{2}\}$ 밑바닥으로 하는 입체가 있다. 이 입체를 x 축에 수직인 평면으로 자른 단면이 정사각형일 때, 이 입체의 부피는?

- ① $\frac{\pi}{8}$ ② $\frac{\pi}{4}$ ③ $\frac{3\pi}{8}$
 ④ $\frac{\pi}{2}$ ⑤ π

[41] 영역 $\{(x, y) : (x-1)^2 + (y-2)^2 \leq 1\}$ 을 y 축 둘레로 회전하여 생긴 회전체의 부피는?

- ① π ② π^2 ③ 2π ④ $2\pi^2$ ⑤ 4π

[42] 이상 적분 $\int_{-\infty}^{\infty} \frac{dx}{16x^2 + 8x + 50}$ 의 값은?

- ① $\frac{\pi}{5}$ ② $\frac{\pi}{4}$ ③ $\frac{\pi}{7}$ ④ $\frac{\pi}{28}$ ⑤ $\frac{\pi}{56}$

[43] 극좌표 방정식 $r = 1 + \sqrt{3} \sin \theta$ 에 주어진 곡선 위의 $\theta = \frac{\pi}{3}$ 인 점에서 이 곡선에 그은 접선의 기울기는?

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

[44] 무한급수 $\sum_{n=1}^{\infty} \frac{1}{2^n} \tan \frac{\pi}{2^{n+1}}$ 의 값은?

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

[45] 다음 중 수렴하는 무한급수는 모두 몇 개인가?

<보기
>

㉠. $\sum_{n=1}^{\infty} \frac{1}{n^{1.21}}$	㉡. $\sum_{n=1}^{\infty} \frac{n^3}{3^n}$
㉢. $\sum_{n=0}^{\infty} \frac{n^3}{2016(n^3 + 1)}$	㉣. $\sum_{n=1}^{\infty} \frac{1}{2^{2016+n}}$

- ① 0개 ② 1개 ③ 2개 ④ 3개 ⑤ 4개

[46] 멱급수 $\sum_{k=0}^{\infty} \binom{1.5}{k} \frac{x^k}{2^k}$ 의 수렴반경은? 단, 실수 p 와 음이 아닌 정수 k 에 대하여 $\binom{p}{k} = \frac{p(p-1)\cdots(p-k+1)}{k!}$ 이다.

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

[47] $f(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{-2n+1}}{2n+1}$ 일 때 $f(1/\sqrt{3})$ 의 값은?

- ① $\frac{\pi}{2}$ ② $\frac{\pi}{3}$ ③ $\frac{\pi}{6}$
④ $\frac{\pi}{9}$ ⑤ $\frac{\pi}{18}$

[48] 실수들로 이루어진 무한급수에 대한 다음 설명 중 옳은 것은?

- ① $\sum_{n=1}^{\infty} a_n$ 이 수렴하면 $\sum_{n=1}^{\infty} |a_n|$ 도 수렴한다.
② $\sum_{n=1}^{\infty} |a_n|$ 이 발산하면 $\sum_{n=1}^{\infty} a_n$ 도 발산한다.
③ $\sum_{n=1}^{\infty} |a_n|$ 이 수렴하면 $\sum_{n=1}^{\infty} a_n^2$ 도 수렴한다.
④ $\sum_{n=1}^{\infty} a_n$ 이 수렴하면 $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}} a_n$ 도 수렴한다.
⑤ $\sum_{n=1}^{\infty} a_n^2$ 이 수렴하면 $\sum_{n=1}^{\infty} a_n$ 도 수렴한다.

[49] 세 점 $(1, 0, 0)$, $(2, 0, -1)$, $(1, 4, 3)$ 을 꼭짓점으로 갖는 삼각형의 넓이는?

- ① 6 ② $\frac{\sqrt{37}}{2}$ ③ $\frac{\sqrt{41}}{2}$
④ $\sqrt{37}$ ⑤ $\sqrt{41}$

[50] 원점에서 직선 $x = 1+t$, $y = 2-t$, $z = -1+2t$ 까지의 거리는?

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