2025학년도
재외국민과 외국인 특별전형 수강능력시험

자연계열

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Directions for questions 1~25: In this part you will read a selection of English texts. Each text is followed by one or more questions. Choose the best answer for each question and mark the number (1), (2), (3), (4), or (5) on your answer sheet.

[Question 1]

Because the bears had already been weakened by disease and drought, a severe winter would have had ___[1]___ consequences for them.

1. Which best fits into the blank [1]? **[1.5점]**

(1) preventive (2) benign (3) tolerable (4) moderate (5) devastating

[Question 2]

For a long time, most medical practitioners asserted that taking massive doses of vitamins was somewhat harmless; now, however, some are warning that excessive dosages can be ___[2]___.

2. Which best fits into the blank [2]? **[1.5점]**

(1) healthy (2) wasteful (3) toxic (4) innocuous (5) trivial

[Question 3]

Columnists often have strong personal opinions about the political events they investigate, and so have great difficulty in remaining ___[3]___ in their writing.

3. Which best fits into the blank [3]? **[1.5점]**

(1) emotional (2) biased (3) impartial (4) eloquent (5) fervent

[Question 4]

With unanimous approval, the Senate ____[4]____ the new law that would forbid companies to discriminate according to race in their hiring practices.

4. Which best fits into the blank [4]? **[1.5점]**

(1) ratified (2) supplanted (3) refuted (4) nullified (5) invalidated

[Question 5]

The similarities of the languages around the Mediterranean were sufficiently apparent to _____[5]_____ ease of movement of both men and ideas; it took comparatively few alterations to make a Spanish song intelligible in Italy, and an Italian trader was able to, without much difficulty, make himself at home in France.

5. Which best fits into the blank [5]? **[1.5점]**

(1) impede (2) preclude (3) eradicate (4) facilitate (5) segregate

[Question 6]

Current geological evidence shows that the earth's magnetic polarity has switched back and forth many times over the millennia; such ___[6]___ in the magnetic field may influence the ability of our planet to avert cosmic radiation.

6. Which best fits into the blank [6]? **[1.5점]**

(1) provocations (2) fluctuations (3) correlations (4) acclamations (5) sanctions

[Question 7]

Many anthropologists had presumed that hunters-gatherers moved constantly in their search for food; however, recent findings demonstrate that during the Mesolithic period, such groups were often quite ___[7]___.

7. Which best fits into the blank [7]? **[1.5점]**

(1) sedentary (2) congenial (3) insolent (4) malicious (5) mobile

[Question 8]

Gathered mares, foals, and stallions are all held in separate corrals before they are trucked to a holding facility. Federal law ___[8]___ the Bureau of Land Management authority to destroy captured horses, and although culling has not occurred since 1982, the option troubles mustang partisans.

8. Which best fits into the blank [8]? **[1.5점]**

(1) addresses (2) complains (3) donates (4) explains (5) grants

[Question 9]

___[9a]___ stealing a loaf of bread for his sister's seven starving children, Jean Valjean ___[9b]___ five years in prison. But his sentence was extended several times for attempted escapes, and he ended up serving a total of 19 years in prison.

9. Which best fits into the blank [9a] and [9b]? **[1.5점]**

	[9a]		[9b]
(1)	convicting	…	was sentenced
(2)	convicted	…	sentenced
(3)	convicted	…	was sentenced to
(4)	convicted of	…	sentenced
(5)	convicted of	…	was sentenced to

[Question 10]

The space agency hopes that examining asteroid samples ____[10a]____ to help unlock secrets of how celestial bodies were formed because their surfaces are believed to have remained ____[10b]____ unchanged over the years, unlike those of larger bodies such as planets or moons.

10. Which best fits into the blank [10a] and [10b]? **[1.5점]**

	[10a]		[10b]
(1)	is expected	…	relative
(2)	are expected	…	relatively
(3)	expects	…	relatively
(4)	is expected	…	relatively
(5)	are expected	…	relative

[Question 11]

On these days, people continue to devote a lot of time and money to their appearance. According to a recent report by the Nielsen Company, they are spending more money today on beauty and health care products than ever before. Worldwide, sales of makeup, dieting, hair- and skin-care products, as well as gym memberships and cosmetic surgery, generate billions of dollars every year.

And there is at least one good reason for the desire to be attractive: beauty is power. Studies suggest that good-looking people make more money, get called on more often in class, and are perceived as friendlier.

But what exactly is beauty? Trying to define it is difficult, and yet we know it when we see it. And our awareness of it may start at a very early age. In one set of studies, six-month-old babies were shown a series of photographs. The faces in the pictures had been rated for attractiveness by a group of college students. In the studies, the babies spent more time looking at the attractive faces than the unattractive ones.

11. According to the passage, the babies in the study _____. **[2.1점]**

(1) were recently entered in a beauty contest
(2) were rated based on beauty and health care
(3) generally perceived charming people as very intimate
(4) were individually shown photographs of college students
(5) distinguished between appealing and unappealing appearances

[Question 12]

She made headlines with her report of chimps hunting bush babies by jamming modified sticks into tree-hole burrows. The technique appears to be used most often by females and the young, which may engineer new foraging methods when food is ___[12a]___ and males ___[12b]___ to share.

12. Which best fits into the blank [12a] and [12b]? **[2.1점]**

	[12a]		[12b]
(1)	scarce	…	refuse
(2)	scanty	…	strive
(3)	meager	…	convince
(4)	bountiful	…	discourage
(5)	abundant	…	deny

[Question 13]

Assume that a mass attached to the end of a string is set in motion. The mass comes to rest at the top of its swing, then falls back in the other direction, gains speed, reaches maximum speed at the bottom of its swing, rises on the other side, and again comes to rest at the top of its swing. Then the process repeats. If there were no friction and no outside disturbance, the pendulum would keep oscillating permanently. If we make the string very light, the pendulum bob is essentially the only mass in the system. Since the bob changes height during its swing, its gravitational energy changes. The pendulum has zero speed and therefore zero kinetic energy at the top of its swing, at maximum height, when its gravitational energy is largest; it has maximum speed and therefore maximum kinetic energy at the bottom of its swing, when its gravitational energy is smallest. Total energy will be conserved if the gain of kinetic energy precisely equals the loss of gravitational energy.

13. Which of the following best describes the relationship between gravitational energy and kinetic energy of the pendulum as it is explained in the passage? **[2.1점]**

(1) As kinetic energy rises, gravitational energy goes up.
(2) As kinetic energy increases, gravitational energy declines.
(3) Gravitational energy stays constant, even as kinetic energy alters.
(4) Kinetic energy remains invariable, even as gravitational energy shifts.
(5) Kinetic energy and gravitational energy are exactly equivalent when the pendulum is at the bottom of its swing.

[Questions 14-16]

Probably, the most important factor involved in becoming an elite athlete is genetics. Most Olympic competitors [14-1] **are equipped with** certain physical characteristics that differentiate them from the average person. Take an elite athlete's muscles, for instance. In most human skeletal muscles (the ones that make your body move), there are fast-twitch fibers and slow-twitch fibers. Fast-twitch fibers help us move quickly. Olympic weightlifters, for example, have a large number of fast-twitch fibers in their muscles - many more than the average person. These allow them to lift hundreds of kilos from the ground and over their heads in seconds. Astonishingly, a large, muscular body is not the main prerequisite to do well in this sport. It is more significant to have a large number of fast-twitch fibers in the muscles. The legs of an elite marathon runner, on the other hand, might contain up to 90 percent slow-twitch muscle fibers. These generate energy efficiently and enable an athlete to control fatigue and keep moving for a longer period of time. When we exercise long or hard, it is common to go through weariness, muscle pain, and difficulty breathing. These feelings are prompted when the muscles produce high amounts of lactate and cannot eliminate it [14-2] **enough quickly**. Athletes with many slow-twitch muscle fibers appear to be able to clear the lactate from their muscles faster as they move. Thus, the average runner might start to feel discomfort halfway into a race. A trained Olympic athlete, however, might not feel soreness until much later in the competition.

For some Olympic competitors, size is important. Most male champion swimmers are 180 cm (six feet) or taller, allowing them to reach longer and swim faster. For both male and female gymnasts, though, a smaller size and body weight mean they can move with greater ease, and are [14-3] **less liable to** suffer injury when landing on the floor from a height of up to 4.5 meters (15 feet).

Some athletes' abilities are naturally ___[15a]___ by their environment. Those raised at high altitudes in countries such as Kenya, Ethiopia, and Morocco have blood that is rich in hemoglobin. Large amounts of hemoglobin [14-4] **carry** oxygen around the body faster, enabling these athletes to run better. Cultural factors also help some athletes do well at certain sports. Tegla Loroupe, a young woman from northern Kenya, has won several marathons. She ___[15b]___ some of her success to her country's altitude (she trains at about 2,400 meters or 8,000 feet) and some to her cultural background. As a child, she had to run ten kilometers to school every day. "I'd be punished if I was late," she says.

Although genetics, environment, and even culture play a part in becoming an elite athlete, training and practice are needed to succeed. Marathon runners may be able to control fatigue and keep moving for long periods of time, but they must train to reach and maintain their goals. Weightlifters and gymnasts perfect their skills by repeating the same motions again and again until they are automatic. Greg Louganis, winner of four Olympic diving gold medals, says divers must train the same way to be successful. Training this way requires an athlete to be not only physically fit but psychologically healthy as well. Athletes have to be good at setting goals, generating energy when they need it, and [14-5] **managing** anxiety.

14. Which of the following underlined expressions is not correct? **[2.1점]**

(1) are equipped with (2) enough quickly (3) less liable to (4) carry (5) managing

15. Which best fits into the blank [15a] and [15b]? **[2.1점]**

	[15a]		[15b]
(1)	enhanced	…	ascribes
(2)	slandered	…	accredits
(3)	intensified	…	adheres
(4)	deprived	…	attributes
(5)	elevated	…	aspires

16. The passage is primarily concerned with _____. **[2.1점]**

(1) how to qualify for the Olympics
(2) how athletes adapt to intense pressure
(3) the different muscle types of an elite athlete
(4) several factors that make someone a super athlete
(5) the importance of training and repeated motions for athletes

[Questions 17-18]

Never before have so many people packed into cities - places such as Los Angeles, Istanbul, Tokyo, and Lima – that are regularly affected by earthquakes. Located near the edge of Earth's huge, shifting plates, these cities face the risk of death and economic adversity from large quakes and from the tsunamis, fires, and other destruction they often trigger.

We understand earthquakes better than we did a century ago. Now, scientists would like to predict them, but is this possible? Today, some of the simplest questions about earthquakes are still difficult to answer: Why do they start? What makes them stop? Perhaps the most important question scientists need to answer is this: Are there clear patterns in earthquakes, or are they basically random and impossible to predict?

In Japan, government scientists say they have an answer to the question. "We believe that earthquake prediction is possible," says Koshun Yamaoka, a scientist at the Earthquake Research Institute at the University of Tokyo. Earthquakes conform to a pattern; they have observable signs, Yamaoka believes. In fact, Japan had already predicted where its next great earthquake will be: Tokai, a region along the Pacific coast about 161 kilometers (100 miles) southwest of Tokyo. Here, two plate boundaries have given rise to huge earthquakes every 100 to 120 years. The theory is that strain is building up in this region, and that it is time for this zone to reduce its stress. Unfortunately, this is more a forecast than a prediction. It is one thing to say that an earthquake is likely to happen in a high-risk area. It is another to predict exactly where and when the quake will occur.

The desire for an accurate prediction of time and place has led to another theory: the idea of "pre-slip." Naoyuki Kato, a scientist at the Earthquake Research Institute, says his laboratory experiments show that before a fault in the Earth's crust finally breaks and causes an earthquake, it slips just a little. If we can ___[17a]___ these early slips taking place deep in the Earth's crust, we may be able to predict the next big quake.

Scientists working in Parkfield, California, in the U.S. are also trying to see if predicting earthquakes is possible. They have chosen the town of Parkfield not only because the San Andreas Fault runs through it, but because it is known for having earthquakes quite regularly – approximately every 22 years. In the late 1980s, scientists in Parkfield decided to study the fault to see if there were any warning signs prior to a quake. To do this, they drilled deep into the fault and set up equipment to register activity. Then they waited for the quake.

Year after year, nothing happened. When a quake did finally hit on September 28, 2008, it was years off schedule, but there were no warning signs. Scientists reviewed the data but could find no evidence of anything unusual preceding the September 28th quake. It led many to believe that perhaps earthquakes really are ___[17b]___ events. Instead of giving up, though, scientists in Parkfield dug deeper into the ground. By late summer 2009, they had reached the fault's final depth of three kilometers (two miles), where they continued collecting data, hoping to find a clue.

And then they found something. In an article published in the July 2012 journal *Nature*, the researchers in Parkfield claimed to have discovered small changes in the fault shortly before an earthquake hit. What had they noticed? Just before a quake, the cracks in the fault had widened slightly. Scientists registered the first changes ten hours before a 3.0 quake hit; they identified identical signs two hours before a 1.0 quake – demonstrating that perhaps the "pre-slip" theory is correct. In other words, it may in fact be possible to predict an earthquake.

Although there is still a long way to go, it appears from the research being done all over the world that earthquakes are not entirely random. If this is so, in the future we may be able to track the Earth's movements and design early-warning systems that allow us to predict when a quake will happen and, in doing so, prevent the loss of life.

17. Which best fits into the blank [17a] and [17b]? **[2.1점]**

	[17a]		[17b]
(1)	belittle	…	random
(2)	ascertain	…	conventional
(3)	detect	…	arbitrary
(4)	recognize	…	consistent
(5)	overlook	…	unpredictable

18. According to the passage, which of the following statements is not true? **[2.1점]**

(1) Earthquake research is going on throughout the world.
(2) The last San Andreas earthquake took place 22 years ago.
(3) Data supporting "pre-slip" theory were found in Parkfield, California.
(4) An enormous earthquake happens in Tokai approximately every century.
(5) Scientists are convinced that "pre-slip" theory can help predict earthquakes.

19. Which of the following has the underlined expression that is not correct? **[2.1점]**

(1) When bothered, cuttlefish ejects a dark ink that clouds the water and allows escaping.
(2) By the time that Spanish explorers first encountered them, the Aztecs had already developed the calendar.
(3) The drainage of swamps and other breeding places of mosquitoes has greatly diminished the incidence of malaria.
(4) A case can be made that it was World War II, with its impact on manufacturing production, that pulled the United States out of the Great Depression.
(5) Due to their strange images, highly experimental syntax, and opaque subject matter, many of John Ashbery's poems can be quite difficult to interpret and thus are the object of heated debate among scholars.

20. Which of the following has the underlined expression that is not correct? **[2.1점]**

(1) Four miles beyond the hills was a fire with its flames reaching up to the sky.
(2) The financial yields of Alaska's petroleum reservoirs is greater than that of its fishing and farming industries combined.
(3) There are few buffaloes roaming the Great Plains today than during the last century due to the campaigns of white Americans against Native Americans.
(4) Mrs. Smith was fond of vases and every year her husband's Christmas present to her was a vase of one sort or another, whatever the clerk showed him, marked at about ten or fifteen dollars.
(5) The number of China's elderly is augmenting thanks to improvements in medicine and sanitation, while the number of people born after the government's one-child policy went into effect in 1979 is dwindling.

21. Which of the following has the underlined expression that is not correct? **[2.8점]**

(1) Bacteria living in the soil play a vital role in recycling the carbon and nitrogen needed by plants.

(2) An announcement was made in parliament today where there has been a very sharp fall in unemployment.

(3) If the current drought goes on much longer, there could be water rationing before the end of the next month.

(4) Had we realized the error earlier, immediate retribution could have been made, and the chaos that unfortunately followed would have been avoided.

(5) With the evolution of wings, insects were able to disperse to the far ecological corners, across deserts and bodies of water, to reach new food sources and live in a wider variety of promising environmental niches.

22. Which of the following has the underlined expression that is not correct? **[2.8점]**

(1) It is the recommendation of the U.S. Public Health Service that all children be vaccinated against various diseases.

(2) Now considered an art form, quilt-marking originated as a means of fashioning bed covers from bits of fabric that otherwise had no use.

(3) The Dallas Theater Center presents plays in two buildings, either of which were designed by the internationally renowned architect, Frank Lloyd Wright.

(4) The early feminist leader Susan B. Anthony became increasingly aware through her work in the temperance movement that women were not guaranteed the same rights as men.

(5) Researcher Haesung Jung led a 2020 study showing that individual acts of kindness can foster prosocial behavior across a larger group. Jung and her team found that bystanders who witness a helpful act become more likely to offer help to someone else, and in doing so, can inspire still others to act.

23. Which of the following has the underlined expression that is not correct? **[2.8점]**

(1) When hummingbirds fly, their wing-beats are so rapid that the wings seem blurred.

(2) Beneath the streets of a modern city exists the network of columns, cables, pipes, and tunnels required to satisfy the needs of its inhabitants.

(3) In 1492 Christopher Columbus, who set sail for undiscovered territory, commanded three ships, all of which reached what was believed to be India.

(4) Common wildlife species that inhabit the park may include white-tailed deer, gray squirrels, opossums, raccoons and foxes as well as reptiles and amphibians.

(5) The earliest metal knives found in Britain come from the grave of a rich man buried a few miles from Stonehenge around 2400 B.C. Made of soft copper from France and Spain, they were probably duller than the flint knives typical of the age, and might be used only for ceremony.

24. Which of the following has the underlined expression that is not correct? **[2.8점]**

(1) Twenty percent of the colonists were still loyal to Britain and fifty percent were indifferent to the war.

(2) Upon reaching the destination, a number of personnel are going to change their reservations and proceed to Hawaii.

(3) If an animal was unable to produce offspring, the zookeepers would simply capture new animals rather than breed the existing animals.

(4) Chinese firms, many of them are state-owned and do not need to field tough questions on ethics from their boards or shareholders, have invested heavily in places where Western companies face severe restrictions.

(5) During a 2014 archaeological dig in Spain, Vicente Lull and his team uncovered the skeleton of a woman from El Algar, an Early Bronze Age society, buried with valuable objects signaling a high position of power. This finding may persuade researchers who have argued that Bronze Age societies were ruled by men to concede that women may have also held leadership roles.

25. Which of the following has the underlined expression that is not correct? **[2.8점]**

(1) Gregory's corrupt dealings earned him such disgrace that any possibility of his being reelected to the city council was completely removed.

(2) Virginia's tidal rivers and shallow bays were thick with meaty sturgeon, which fed English colonists and Indians alike. Overfishing in the late 1800s would leave the species nearly extinct.

(3) A young female chimpanzee grips a limb with her feet as she tightropes some 30 feet above the forest floor. Chimps feature curved toe bones that help them grasp trees and vines as they navigate the forest canopy.

(4) The use of a petroleum-based fuel infrastructure has been sustained in the last hundred years by the balance of supply and demand. However, with the development and growth of countries and populations, the demand for fossil fuels has begun to excel the natural supply, threatening worldwide energy security.

(5) A coalition of research institutes from 5 countries has joined with a humanitarian group, "Doctors Without Borders," to try to find cures for some of the diseases afflicting the world's poorest people. Dale Gavilack reports that the coalition hopes to better the lives of millions of people bypassed by much of modern medicine.

26. 다항식 x^3+ax^2-5x+b가 $(x-1)(x+2)$로 나누어떨어질 때, 상수 a, b에 대하여 ab의 값은? **[1.5점]**

① -16 ② -15 ③ -14 ④ -12 ⑤ 6

27. 사차방정식 $x^4+ax^3-x^2-x+b=0$의 한 근이 i일 때, $a+b$의 값은? (단, a,b는 실수) **[1.5점]**

① -3 ② -1 ③ 1 ④ 3 ⑤ 5

28. 모든 실수 x에 대하여 이차부등식 $x^2+2kx+k+2>0$이 성립하게 하는 실수 k의 값의 범위가 $a<k<b$일 때, $a-b$의 값은? **[1.5점]**

① -5 ② -3 ③ -1 ④ 1 ⑤ 4

29. 실수 k에 대하여 점 (k,k^2)과 직선 $2x-y-3=0$ 사이의 거리가 최소가 되게 하는 k의 값은? **[2.1점]**

① -1 ② 0 ③ 1 ④ 2 ⑤ 3

30. 다음의 두 조건 p, q에 대하여 명제 $p \rightarrow q$가 참이 되게 하는 a의 최댓값은? **[2.8점]**

p : x는 정수이고 부등식 $|x+1| \leq \frac{5}{2}$를 만족한다. $q : x \geq a$

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

31. 중심의 좌표가 $(-3, 2)$이고 반지름의 길이가 2인 원의 방정식이 $x^2+y^2+Ax+By+C=0$일 때, 상수 A, B, C를 순서대로 나열한 것은? **[1.5점]**

① $3, -2, 9$ ② $6, -4, 9$ ③ $-3, 2, 4$ ④ $-6, 4, 4$ ⑤ $-6, 4, 13$

32. 함수 $f(x)=\sqrt{-2x+a}+b$의 정의역이 $\{x|x \leq 3\}$이고, 치역은 $\{y|y \geq -2\}$이다. 이때 $a+b+f(1)$의 값은? (단, a, b는 상수) **[2.1점]**

① 2 ② 3 ③ 4 ④ 5 ⑤ 6

33. $x \neq -1$인 모든 실수 x에 대하여 다음 등식이 항상 성립할 때, 상수 a, b, c에 대하여 abc의 값은? **[2.1점]**

$$\frac{a}{x+1}+\frac{bx+c}{x^2-x+1}=\frac{3}{x^3+1}$$

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

34. 이어달리기에 참가하는 남학생 3명과 여학생 3명을 일렬로 세울 때, 여학생을 양 끝에 세우는 경우의 수는? **[1.5점]**

① 24 ② 36 ③ 72 ④ 108 ⑤ 144

35. 부등식 $\left(\frac{1}{3}\right)^{2x+1} \geq \frac{1}{27\sqrt{3}}$을 만족시키는 실수 x의 최댓값은? **[1.5점]**

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

36. 다음 중 옳은 것을 모두 고른 것은? **[2.8점]**

㉠ $\log_5 35 - \log_5 8$의 값은 1보다 크다.
㉡ $\log_{10} 2 = a$, $\log_{10} 3 = b$일 때, $\log_{10}\left(\frac{6}{5}\right) = 2a + b - 1$이다.
㉢ $\log_8 32 = a$일 때, $\frac{3}{2} < a < 2$이다.

① ㉠ ② ㉡ ③ ㉠, ㉡ ④ ㉡, ㉢ ⑤ ㉠, ㉢

37. 다음 중 부등식 $\tan x > -1$을 만족시키는 실수 x가 아닌 것은? **[1.5점]**

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

38. 다음 중 함수 $f(x)=-2\sin 2x+2$ 에 대한 설명으로 옳은 것을 모두 고른 것은? **[2.8점]**

㉠ 함수 $f(x)$의 주기는 함수 $g(x)=\tan x$와 주기가 같다.
㉡ $\frac{3}{4}\pi \le x \le \pi$에서 함수 $f(x)$의 최댓값은 4이고 최솟값은 2이다.
㉢ $\frac{\pi}{6} \le x \le \frac{\pi}{3}$를 만족하는 모든 x에 대하여 $f(x)>0$이다.
㉣ 모든 실수 x에 대하여 $f(x)=-f(-x)$이다.

① ㉠, ㉡ ② ㉡, ㉣ ③ ㉢, ㉣ ④ ㉠, ㉡, ㉢ ⑤ ㉠, ㉢, ㉣

39. $0 \le x \le \pi$일 때, 함수 $f(x)=\cos^2\left(x+\frac{\pi}{2}\right)+\cos^2 x+2\sin\left(\frac{\pi}{2}-x\right)$의 최댓값을 a, 최솟값을 b라 할 때, ab의 값은? **[2.1점]**

① -6 ② -3 ③ 0 ④ 3 ⑤ 6

40. 첫째항이 4, 공비가 $\frac{1}{4}$인 등비수열의 일반항을 a_n이라고 할 때, $\sum_{k=1}^{20} \log_2 a_k$의 값은? **[2.1점]**

① -380 ② -370 ③ -360 ④ -350 ⑤ -340

41. 수열 $\{a_n\}$의 일반항이 $a_n = \dfrac{2}{n(n+2)}$일 때, $\displaystyle\sum_{k=1}^{49} a_{2k}$의 값은? **[2.1점]**

① $\dfrac{47}{101}$ ② $\dfrac{48}{101}$ ③ $\dfrac{49}{101}$ ④ $\dfrac{49}{100}$ ⑤ $\dfrac{51}{100}$

42. 다항함수 $f(x)$가 $\displaystyle\lim_{x\to\infty}\frac{f(x)}{x^2} = 2$, $\displaystyle\lim_{x\to 1}\frac{f(x)}{x-1} = 6$을 만족시킬 때, $f(2)$의 값은? **[1.5점]**

① 8 ② 10 ③ 12 ④ 16 ⑤ 17

43. 곡선 $y = x^2 - 5x + 6$에 접하고 기울기가 3인 접선의 방정식이 $y = ax + b$이다. 이때, $a+b$의 값은? (단, a, b는 상수) **[1.5점]**

① -11 ② -10 ③ -9 ④ -8 ⑤ -7

44. 다음 중 두 함수 $f(x)$, $g(x)$에 대한 설명으로 옳은 것을 모두 고른 것은? **[2.8점]**

㉠ $\displaystyle\lim_{x\to a} f(x)$와 $\displaystyle\lim_{x\to a} g(x)$의 값이 각각 존재하면 $\displaystyle\lim_{x\to a}\frac{f(x)}{g(x)}$의 값도 존재한다.
㉡ $\displaystyle\lim_{x\to a} f(x)$와 $\displaystyle\lim_{x\to a}\{f(x)+g(x)\}$의 값이 각각 존재하면 $\displaystyle\lim_{x\to a} g(x)$의 값도 존재한다.
㉢ $\displaystyle\lim_{x\to a} f(x) = \infty$, $\displaystyle\lim_{x\to a} g(x) = \infty$이면 $\displaystyle\lim_{x\to a}\{f(x)-g(x)\} = 0$이다.

① ㉠ ② ㉡ ③ ㉠, ㉡ ④ ㉡, ㉢ ⑤ ㉠, ㉡, ㉢

45. 상수 a,b에 대하여 함수 $f(x)=\begin{cases} ax^2-14x+16 & (x \geq 3) \\ 2x^2-8x+b & (x<3) \end{cases}$가 $x=3$에서 미분가능할 때, $a+b$의 값은? **[2.1점]**

① 8 ② 9 ③ 10 ④ 11 ⑤ 12

46. 함수 $f(x)=x^3-6x^2+11x-6$에 대하여 닫힌구간 $[1,3]$에 포함되고 $\frac{f(3)-f(1)}{3-1}=f'(c)$를 만족하는 모든 실수 c값들의 합은? **[2.1점]**

① 4 ② 5 ③ 6 ④ 7 ⑤ 8

47. 수직선 위를 움직이는 두 점 P, Q의 시간 $t\,(t \geq 0)$에서의 위치가 각각 $f(t)=t^2-5t+5$, $g(t)=-2t^2+7t-4$이다. 두 점 P, Q가 처음 만나는 시간에서 점 P의 속도를 a, 점 Q의 속도를 b라고 할 때, $a-b$의 값은? **[2.1점]**

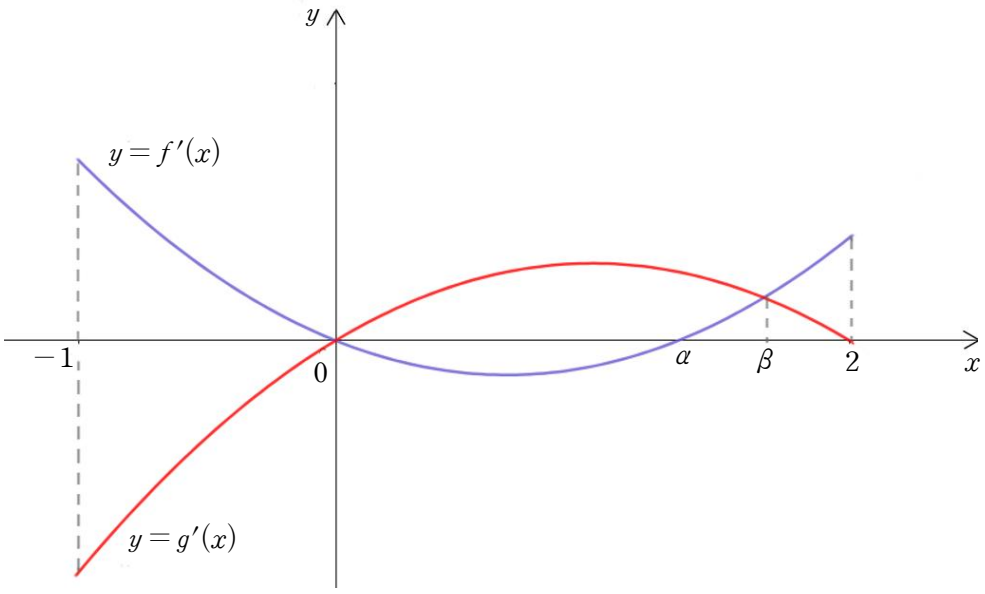
① -9 ② -6 ③ -3 ④ 0 ⑤ 6

※ 48번~50번은 세트형 문제입니다. 아래 제시문을 보고 물음에 답하십시오.

두 삼차함수 $f(x), g(x)$는 $f(-1)=-2,\ g(-1)=6$을 만족한다. 도함수 $f'(x), g'(x)$의 그래프가 아래 그림과 같고

$$f'(0)=0,\ f'(\alpha)=0,\quad g'(0)=0,\ g'(2)=0,\quad f'(\beta)=g'(\beta)$$

이다. (단, α, β는 $0<\alpha<\beta<2$를 만족하는 상수) 함수 $h(x)=f(x)-g(x)$라고 하자.



48. 아래 표에 제시된 각각의 구간에서 함수 $h(x)$의 증가 감소를 올바르게 나타낸 것은? **[1.5점]**

	$-1<x<0$	$0<x<\beta$	$\beta<x<2$
①	감소	감소	감소
②	감소	증가	감소
③	감소	증가	증가
④	증가	감소	증가
⑤	증가	증가	증가

49. $\alpha=\frac{4}{3}$, $\beta=\frac{5}{3}$, $f'(-1)=7$일 때, $h(x)=ax^3+bx^2+cx+d$이다. 이때, $a+b+c+d$의 값은? (단, a, b, c, d는 상수) **[2.8점]**

① -12 ② -8 ③ -4 ④ 0 ⑤ 4

50. 문항 **49**에서 구한 함수 $h(x)$에 대하여, $-1 \leq x \leq 2$에서 $h(x) \leq 0$을 만족시키는 x 중에서 가장 큰 수를 c라고 할 때, 정적분 $\int_{-1}^{c} h(x)dx$의 값은? **[2.1점]**

① $-\frac{5}{2}$ ② -6 ③ $-\frac{13}{2}$ ④ -10 ⑤ $-\frac{21}{2}$