

2015학년도 송실대학교 편입학 시험 문제



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2015학년도 숭실대학교 편입학 시험 문제 (자연계)

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수험번호 :

성명 :

문항배점 : [1-10] 1점 / [11-20] 2.5점 / [21-25] 3점 / [26-32] 1.7점 / [33-43] 2점 / [44-50] 2.3점

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

[1] Advances ① in technology now allow us to prolong life ② in ways that were unimaginable decades ago. But should people be forced or expected to prolong lives that ③ are unbearably painful, or that ④ is in effect "lifeless"?

[2] Initially, epidemiologists concentrated on the scientific study of epidemics, ① focus on how they started and spread. Contemporary social epidemiology is ② much broader in scope, ③ concerned not only with epidemics ④ but also with nonepidemic diseases, injuries, and mental illness.

[3-6] Choose the expression that is closest in meaning to the underlined part. (각 1점)

[3] Elders generally enjoy higher status in traditional societies than in modern industrialized societies. Part of the reason is that it is no mean feat to grow into old age in traditional societies, which typically have far fewer elderly than modern societies.

- ① a great achievement ② a public disgrace
③ not meaningful ④ marginally significant

[4] Brown met with his client behind bars for the first time Monday to begin building a defense.

- ① in court ② in prison
③ in the restaurant ④ in the saloon

[5] He looked as if he was dying for a cigarette: he gave up smoking two years ago when his secretary got lung cancer.

- ① was getting sick because of smoking
② very much wanted to smoke
③ was about to die from smoking
④ was seriously opposed to smoking

[6] He became the point man for the museum's resistance to creditors' insistence that it be forced to sell art treasures. The museum's position boiled down to more politely stated ways of saying "over our dead bodies."

- ① We'll sell the paintings to creditors.
② The paintings will be useless when we die.
③ We'll never sell the paintings.
④ The paintings will be sold to the museum.

[7-10] Choose the most appropriate word for each blank. (각 1점)

[7] To determine the number of poor people, the government first _____ poverty as the lack of minimum food and shelter necessary for maintaining life, which sociologists call absolute poverty.

- ① decides ② defines ③ denounces ④ dictates

[8] One of the most important discoveries about viruses is that they are all _____. The reason they cannot be grown on a bacterial growth medium is that they lack the enzymes and metabolic pathways commonly found in living cells; therefore they must invade cells and use the metabolic machinery of their hosts to complete their life cycles.

- ① creatures ② exterminators ③ parasites ④ plants

[9] The general public seems to hold less _____ for doctors than before. According to a Gallup poll, 57 percent of the people questioned agreed that "doctors don't care about people as much as they used to."

- ① animosity ② curiosity ③ esteem ④ privacy

[10] There hasn't been a major new antibiotic discovered in 25 years, but researchers say a drug called *teixobactin* could be the biggest _____ in a generation.

- ① breakthrough ② collapse
③ fragmentation ④ misfortune

[11-13] Read the following passage and answer the questions. (각 2.5점)

In an argument first published as an article in *Atlantic Monthly* in 1992 and later in a book, *Jihad vs McWorld*, Benjamin Barber offered a hotly debated thesis on globalization. As the title suggests, Barber focuses on the (1) antagonism between Jihad and McWorld. Whereas McWorld refers to the expansion of a unified political and cultural process that is progressively becoming omnipresent throughout the world, Jihad, as Barber defines it, is the localized, reactionary force that bolsters cultural parochialism, but which also leads to greater political heterogeneity throughout the world. However, he argues that Jihad must, in the end, (A) _____.

Jihad is usually associated with Islam, where it means the spiritual effort, struggle, and striving of the heart against vice, passion, and ignorance. It should be noted, however, that Barber does not restrict the use of the term to Islam; rather he uses it (2) rhetorically to refer to groups that aim to redraw boundaries and reassert ethnic, racial, tribal, and/or religious identities. Thus, non-Islamic examples of Jihad include the Basque separatists, the Catholic of Northern Ireland, Quebecois, and Puerto Ricans, among others.

By McWorld, on the other hand, Barber means the global businesses--McDonald's, Microsoft, Disney, Coca-Cola, Panasonic, Kentucky Fried Chicken, etc.--that are producing global (3) heterogeneity. He reduces all of them to "Mc" in order to highlight and to critique the culturally homogeneous nature of their products. McWorld suggests the threatening aspects of unregulated capitalism as well as the damage caused by the international corporations, which are committed to large and fast profits through their aggressive global expansion. Taken together, McWorld and Jihad symbolize a planet simultaneously being drawn together by communications and commerce and being split apart by the "Jihad" of fanatics and terrorists.

In Barber's view, McWorld is the true driving force in globalization and ultimately the more powerful of the two processes on which he focuses. A combination of economic expansionism and the spread of popular culture, McWorld produces a global marketplace in which the sovereignty of the nation-state is surrendered to (4) transnational commerce.

[11] Which of the following best fits in (A)?

- ① yield to McWorld ② coexist with McWorld
③ compete with McWorld ④ win over McWorld

[12] Which of the following is NOT appropriate in the context?

- ① (1) antagonism ② (2) rhetorically
③ (3) heterogeneity ④ (4) transnational

[13] Which of the following is true?

- ① Barber's argument on globalization first appeared in *Jihad vs McWorld*.
② Barber limits the use of Jihad to Islam, excluding non-Islamic Jihad.
③ Quebecois are different from Puerto Ricans in terms of non-Islamic Jihad.
④ Microsoft, Disney, Coca-Cola, and Panasonic belong to McWorld.

[14-16] Read the following passage and answer the questions. (각 2.5점)

Near the beginning of a speech on Dec. 17, 2014, announcing that the U.S. and Cuba would begin to resume full diplomatic relations after more than 50 years, President Barack Obama made a personal aside. "I was born in 1961," he said, "just over two years after Fidel Castro took power in Cuba and just a few months after the Bay of Pigs invasion." The point was clear: Americans and Cubans (1) had been living in thrall to a history that had unfolded before most of them had even been born. People had changed, but the policy hadn't. It was long since time to break free.

But if Obama and his Cuban counterpart, Raul Castro, put an overdue end to one era of Cuban-American relations, it remains unclear what the future will look like. The trade embargo is still in place, if weakened by Obama's actions, and while American businesses are eager to seize a piece of paradise, the Cuban government still controls the economic levers. The Castro regime remains firmly in power, a factor not lost on the many Cuban Americans who saw Obama's move as a (A) _____. "It may well strengthen the Castros and entrench a new generation of their oppressors in power unless Congress steps in to stop it," Cuban-American Senator Ted Cruz wrote on TIME.com.

Just negotiating the deal was difficult enough, requiring a year of secret talks between the two countries, with an assist by Pope Francis. It wasn't until Cuba agreed to release Alan Gross, a 65-year-old American contractor who had been convicted of espionage by a Cuban court in 2011, that the historic shift became a possibility.

The prisoner release paves the way for Obama to loosen restrictions on trade, travel and diplomacy. Secretary of State John Kerry will launch efforts to re-establish an embassy in Havana. He will also review Cuba's place on the list of state sponsors of terrorism, where it has been since 1982, even as countries like North Korea have been taken off. And Americans will be allowed to send more money to the island nation.

[14] Which of the following does the underlined (1) mean?

- ① had been subject to hostile relationships
② had been living harmoniously with each other
③ had actively sought ways to resolve the hatred
④ had exchanged human and material resources

[15] Which of the following is true?

- ① The U.S. trade sanctions against Cuba have been lifted with the resumption of diplomatic relations.
② The power of the Castro regime has greatly diminished over the past 50 years.
③ Cuba has been on the U.S. list of state sponsors of terrorism for more than three decades.
④ Alan Gross mediated the secret talks between the U.S. and Cuba as an espionage.

[16] Which of the following best fits in (A)?

- ① humility ② betrayal ③ profanity ④ fortune

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

Earlier in 2014, Fiat Chrysler boss Sergio Marchionne joked that he hoped consumers wouldn't buy the Fiat 500e (e for electric), because the company loses \$14,000 on each one, given the cost of the technology inside. That shows the bind that carmakers find themselves in these days: Americans have been buying more green cars of all types, but as gas prices plummet, companies have resorted to steep discounts to keep sales from stalling.

Automakers sold about 90,000 hybrid electrics, plug-in hybrid electrics and battery-powered electrics through September, a 30% increase over 2013 in what will likely be a record year. Sales of plug-ins--which can be recharged overnight--are up nearly 85%, according to the Electric Drive Transportation Association.

But sales are sensitive to the price of gas. Last month green-car sales flagged by some 30% as average prices at the pump in the U.S. dropped to near \$3 a gallon, the lowest since 2010. With oil at \$80 a barrel and falling, cheap gas could be with us for a while.

The efficiency of old-line internal combustion engines is also making green-car dealers' lives harder. The passenger car's fuel-economy average is now 36.5 m.p.g. (6.4 L/100 km), according to the U.S. Department of Transportation, and on its way to 54.5 m.p.g. (4.3 L/100 km) as a result of regulations implemented by the Obama Administration in 2012. That, along with gas prices, is making electrics less compelling. "When gas is \$3 a gallon, people are saying, 'Why do I need to?'" says Patrick Olsen, editor of Cars.com. "People are not willing to put up with the slight inconvenience of having to charge their car."

Plug-ins like Marchionne's Fiat 500e are still more cost-effective to drive. Owners pay the equivalent of \$1.29 a gallon to run their cars, according to the U.S. Department of Energy. But so far, (1) consumers aren't doing the math. The differences among electric models also make it hard for the average consumers to make sense of the wider array of new high-tech models.

[17] Which of the following does the underlined (1) mean?

- ① consumers do not recognize the cheap cost of running plug-in cars
② consumers are allergic to figuring out the price of plug-in cars
③ consumers are not sensitive to the diverse models of new cars
④ consumers are not calculating the cost of repairing a green car

[18] Which of the following is NOT a factor affecting the flagging sales of green cars?

- ① falling gas prices
② lack of effort to offer price discounts
③ differences among electric models
④ enhanced efficiency in internal combustion engines

[19] Which of the following is true?

- ① A total of 90,000 green cars were sold in 2014.
② Fiat Chrysler made huge profits from selling the Fiat 500e.
③ Plug-in cars are charged in less than an hour.
④ People don't like to endure charging green cars.

[20-22] Read the following passage and answer the questions. (20: 2.5점, 21-22: 각 3점)

People have been interested in how the brain works for

centuries, and the study of language provides a unique opportunity to deepen our understanding of this complex organ. We've come a long way since the practices of the early Egyptians, who considered the heart, not the brain, the center of intelligence. We've also moved forward since the early nineteenth century, when Franz Joseph Gall proposed that certain areas of the brain control certain behaviors. Though this idea of localization is still of use today, Gall's work led to the (quite unscientific) theory of phrenology, the study of the connection between personality traits and the bumps of the skull. Now, with electroencephalography (EEG), positron emission tomography (PET) scans, and functional magnetic resonance imaging (fMRI), we've come a long way! Language disorders that result from trauma to the brain provide a rich resource for information leading to our understanding of the brain and at the same time expand our knowledge of the innateness of human language.

People who experience damage to the brain, particularly to the frontal lobe of the left hemisphere, typically experience certain kinds of language disorders and deficits. Such language-related disorders and deficits, called aphasia, provide us with insights into the areas of the brain that seem to be primarily responsible for language. The two major types of disorder are Broca's aphasia, named after Paul Broca, a French physician, who first described it in the 1860s; and Wernicke's aphasia, named after German physician Karl Wernicke, who first described this type of language deficit in the 1870s. Their research led to a new field of neuroscience. There are many different aphasias, including agraphia, alexia, and anomia.

Both Broca's and Wernicke's aphasias provide evidence for the separation of language from other cognitive abilities, for patients with these language disorders can be in command of other faculties that aren't closely tied to language. They test well on nonverbal IQ tests, and they can set clocks, read maps, make things, and carry out commands, suggesting that at least in some ways, (A) _____.

- [20] Which of the following best fits in (A)?
- ① cognitive disorder leads to different types of aphasia
 - ② language and cognition are dependent upon each other
 - ③ cognitive abilities are derived from other language abilities
 - ④ language abilities are separated from other cognitive abilities
- [21] Which of the following is true about Broca and Wernicke?
- ① They were born in the 20th century.
 - ② They were French nationals.
 - ③ They were physicians.
 - ④ They established phrenology.

- [22] Which of the following is NOT true?
- ① The early Egyptians thought the heart was the center of intelligence.
 - ② Phrenology has been accepted as a scientific theory.
 - ③ Agraphia, alexia, and anomia are types of aphasia.
 - ④ Gall's idea of localization is currently useful.

[23-25] Read the following passage and answer the questions. (각 3점)

The American military does a lot of work in the field of biomimicry, stealing designs from nature for use in new technology. After all, if you're going to design a robot, where better to draw inspiration than from billions of years of evolution? The latest result of these efforts is the GhostSwimmer: The Navy's underwater drone designed to look and swim like a real fish.

The new gizmo, at five feet long and nearly 100 pounds, is

about the size of an albacore tuna but looks more like a shark, at least from a distance. It's part of an experiment to explore the possibilities of using biomimetic, unmanned, underwater vehicles, and the Navy announced it wrapped up testing of the design last week.

The robot uses its tail for propulsion and control, like a real fish. It can operate in water as shallow as 10 inches or dive down to 300 feet. It can be controlled remotely via a 500-foot tether, or swim independently, periodically returning to the surface to communicate. Complete with dorsal and pectoral fins, the robofish is stealthy too: It looks like a fish and moves like a fish, and, like other underwater vehicles, is difficult to spot even if you know how to look for it.

Down the line, it could be used for intelligence, surveillance, and reconnaissance missions, when it's not assigned to more mundane tasks like inspecting the hulls of friendly ships. Animal lovers will be glad to hear that the GhostSwimmer could take the jobs of the bottlenose dolphins and California sea lions the Navy currently trains to spot underwater mines and recover equipment.

- [23] Which of the following best explains the identity of the GhostSwimmer?
- ① A swimmer who dives into the shadow
 - ② A robot which looks like a ghost
 - ③ A fish which swims deep in the water
 - ④ A robot which operates under the water
- [24] Which of the following is the main feature of biomimicry?
- ① Making a machine look similar to a living creature
 - ② Operating a machine remotely by a living creature
 - ③ Replacing a machine by a living creature
 - ④ Manufacturing a machine at the expense of a living creature
- [25] Which of the following is NOT true about the GhostSwimmer?
- ① It can be used for spying on enemies.
 - ② It is one example of biomimicry for military purpose.
 - ③ It can be easily detected once you know how to find it.
 - ④ It can replace dolphins being trained for military purposes.

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[26] 방정식 $x^5 + 3x + 1 = 0$ 의 실근의 개수는? (1.7점)
 ① 0 ② 1 ③ 3 ④ 5

[27] 다음 중 함수 $f(x) = 3x^4 - 4x^3 - 12x^2 + 6$ 의 역함수를 정의할 수 있는 구간은? (1.7점)
 ① $-2 \leq x \leq 0$ ② $-1 \leq x \leq 1$ ③ $0 \leq x \leq 2$ ④ $1 \leq x \leq 3$

[28] 극한 $\lim_{x \rightarrow 0} \frac{1}{x} \int_0^x \cos(\pi t) e^{2015t} dt$ 의 값은? (1.7점)
 ① π ② e ③ 1 ④ -1

[29] 매개곡선 $x = 3 + 2t^2$, $y = t^2 + t^3$ 이 위로 오목한 t 의 범위는? (1.7점)
 ① $-\infty < t < \infty$ ② $t > -\frac{2}{3}$ ③ $t > 0$ ④ $t < 0$

[30] 곡선 $y = e^x$ 위의 점 P 에서 그은 접선이 원점 O 를 지날 때 선분 $\overline{OP}$ 의 길이는? (1.7점)
 ① 1 ② e ③ $\sqrt{e+1}$ ④ $\sqrt{e^2+1}$

[31] 극한 $\lim_{x \rightarrow 0^+} \frac{e^{-\frac{1}{x}}}{x}$ 의 값은? (1.7점)
 ① 0 ② 1 ③ e^{-1} ④ e

[32] 다음 급수 중 수렴하지 않는 것은? (1.7점)
 ① $\sum_{n=1}^{\infty} \frac{\sin n}{n^2}$ ② $\sum_{n=1}^{\infty} (-1)^n \frac{3n}{4n+7}$
 ③ $\sum_{n=1}^{\infty} \frac{n!}{n^n}$ ④ $\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^3}$

[33] 아래와 같이 정의된 두 함수

$$f(t) = \begin{cases} \frac{1}{1 + \sin t}, & 0 \leq t \leq \frac{\pi}{2} \\ -\frac{1}{\pi}t + 1, & \frac{\pi}{2} < t \leq \pi, \end{cases} \quad F(x) = \int_0^x f(t) dt \quad (0 < x < \pi)$$

에 대하여 다음 중 옳은 것을 모두 고르면? (2.0점)

- ㉠. $F(x)$ 는 연속함수이다.
 ㉡. $F(x)$ 는 미분가능한 함수이다.
 ㉢. $F(x)$ 는 증가함수이다.

① ㉠, ㉡ ② ㉠, ㉢ ③ ㉡, ㉢ ④ ㉠, ㉡, ㉢

[34] 수열 $a_n = \int_{-n}^n \frac{1}{1+x^2} dx$ 의 극한값은? (2.0점)
 ① 0 ② $\frac{\pi}{2}$ ③ π ④ 2π

[35] 함수 $f : \mathbb{R} \rightarrow \mathbb{R}$ 이 미분가능하고, 구간 $(-2, 3)$ 에서 부등식 $-1 \leq f'(x) \leq 2$ 를 만족할 때 $a = f(3) - f(-2)$ 의 범위는? (2.0점)
 ① $-15 \leq a \leq -10$ ② $-10 \leq a \leq -5$
 ③ $-5 \leq a \leq 10$ ④ $10 \leq a \leq 15$

[36] 구간 $[0, 3]$ 에서 곡선 $y = \frac{2}{3}x^{\frac{3}{2}} - 1$ 의 길이는? (2.0점)
 ① 9 ② $\frac{15}{2}$ ③ 7 ④ $\frac{14}{3}$

[37] 반복적분 $\int_0^1 \int_x^1 x^2 e^{y^4} dy dx$ 의 값은? (2.0점)
 ① $\frac{1}{12}(e-1)$ ② $\frac{1}{9}(e+1)$ ③ $\frac{e}{9}$ ④ $\frac{e}{4}$

[38] 다음 급수 중 수렴반경이 가장 큰 것은? (2.0점)
 ① $\sum_{n=1}^{\infty} \frac{x^n}{e^n}$ ② $\sum_{n=1}^{\infty} \frac{(x-1)^n}{n!}$
 ③ $\sum_{n=1}^{\infty} \frac{(x+2)^n}{n^3}$ ④ $\sum_{n=1}^{\infty} \frac{x^n}{2n(n+1)}$

[39] $f(x, y, z) = xe^{2yz}$ 일 때 점 $P(3, 0, 2)$ 에서 $\mathbf{u} = \langle 2, -2, 1 \rangle$ 방향으로의 방향도함수의 값은? (2.0점)

- ① -22 ② $-\frac{22}{3}$ ③ $\frac{22}{9}$ ④ 11

[40] 점 $P(1, 0, 2)$ 와 직선 $x = 1 + 2t, y = -1, z = -t$ 사이의 거리는? (2.0점)

- ① $\sqrt{\frac{2}{5}}$ ② $\sqrt{2}$ ③ $\sqrt{\frac{21}{5}}$ ④ $\sqrt{21}$

[41] $w = \ln(x^2 + y^2 + z^2), x = s + 2t, y = 2s - t, z = 2st$ 이고 $s = t = 1$ 일 때 $\frac{\partial w}{\partial t}$ 의 값은? (2.0점)

- ① $\frac{1}{14}$ ② $\frac{3}{14}$ ③ $\frac{4}{7}$ ④ $\frac{9}{7}$

[42] 다음 중 세 점 $P(1, 2, -1), Q(2, 3, 1), R(3, 1, 0)$ 을 포함하는 평면에 수직인 벡터는? (2.0점)

- ① $\langle -1, -1, 1 \rangle$ ② $\langle -1, 0, 1 \rangle$ ③ $\langle 1, -1, 1 \rangle$ ④ $\langle 1, -1, 0 \rangle$

[43] $a \neq 0$ 이고 함수

$$f(x) = \begin{cases} \frac{|x|}{x}, & |x| \geq 1 \\ ax^2 + bx + c, & |x| < 1 \end{cases}$$

가 실수 전체에서 연속일 때 항상 참인 것은? (2.0점)

- ① $ab > 0$ ② $ab < 0$ ③ $abc > 0$ ④ $abc < 0$

[44] 초깃값문제 $y'' - y' - 6y = 0, y(0) = -3, y'(0) = 11$ 의 해를 $\phi(x)$ 라 할 때 $\phi(\ln 2)$ 의 값은? (2.3점)

- ① 7 ② 8 ③ 9 ④ 10

[45] 극한 $\lim_{n \rightarrow \infty} \frac{2}{n} \sum_{k=1}^n \left[\left(1 + \frac{2k}{n}\right)^2 - \left(1 + \frac{2k}{n}\right) \right]$ 의 값은? (2.3점)

- ① $\frac{9}{2}$ ② $\frac{10}{3}$ ③ $\frac{14}{3}$ ④ $\frac{23}{6}$

[46] 곡선 $y^2 = 3 - x$ 와 직선 $x = 2$ 로 둘러싸인 부분을 y 축을 중심으로 회전하여 얻은 입체의 부피는? (2.3점)

- ① $\frac{16}{5}\pi$ ② $\frac{32}{5}\pi$ ③ $\frac{52}{5}\pi$ ④ $\frac{72}{5}\pi$

[47] 두 벡터 $\mathbf{u} = \langle 3, -1, 4 \rangle$ 와 $\mathbf{v} = \langle 2, 0, 1 \rangle$ 에 대하여 $\mathbf{v}$ 에 수직인 $\mathbf{u}$ 의 벡터성분의 크기는? (2.3점)

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

[48] $f(x) = \sum_{n=0}^{\infty} (-1)^n \frac{1}{n!} x^n$ 일 때 $f'(1)$ 의 값은? (2.3점)

- ① -1 ② $-e^{-1}$ ③ 2 ④ e

[49] 두 평면 $2x - y + z = 0$ 과 $y + z + 1 = 0$ 의 교선에 평행하고 직선 $\frac{x}{3} = y - 1 = \frac{z}{2}$ 를 포함하는 평면의 방정식은? (2.3점)

- ① $3x - 5y - 2z + 5 = 0$ ② $3x - 5y - 2z - 5 = 0$
③ $x + y - z + 1 = 0$ ④ $x + y - z - 1 = 0$

[50] 연립일차방정식

$$\begin{aligned} 2x + 3y + kz &= 1 \\ -2x + y + 2z &= 0 \\ x - y - 2z &= 2 \end{aligned}$$

가 해를 갖지 않도록 하는 k 의 값은? (2.3점)

- ① -18 ② -6 ③ 0 ④ 6