入学試験問題集

2019年度

国際高等専門学校
小論文、学力試験（数学、英語）における出題について

【小論文】
課されたテーマについて理解し、自身の意見・主張が具体的な考え・事例などに基づいて論理的に述べられているか、また、考え方の主張の仕方や説得力のある効果的な展開ができているか、文章に首尾一貫性があるかなどをみます。

【数学】
設問は、計算問題を中心に基礎的な理解を求める問題を幅広い分野から出題します。問題は教科書の例題や練習問題にあるような基本事項を問う出題が多なくなっています。正確な計算力と計算過程をきちんと書く習慣をつけておくことが必要です。

【英語】
設問は、中学校で学習する内容を、対話、表、グラフ、要約、長文などの形式で、文法や読解（内容理解）に関する問題など幅広く出題します。また、リスニング力も重視しています。学校での学習を確実に身に付けていれば十分に回答できる問題です。

※本冊子は、2019年度入学試験問題の一部を掲載したものです。

2019年4月
国際高等専門学校 入試センター
2019年度入学試験問題

【小論文】

グローバル入試 A
Many companies are researching and developing driverless cars.
When driverless cars become common, this will cause many changes in our daily life and society. Explain what these changes will be.

research and develop: study and produce a new idea and product / 研究開発する
driverless cars: cars that do not need drivers / 自動運転車
common: usual, normal, happening often / 一般的な・よくある
cause: create, result in ~ / ～を引き起こす
2019年度入学試験問題

【小論文】

自己推薦入試
もし歴史上の人物に会えるとしたならば、あなたは誰と会って、どのような話をしたいと思いますか。理由を交えながら記述しなさい。

If you could travel backward in time and meet anyone in history, which famous historical person would you want to meet and talk with? What questions would you want to ask, and what topics would you want to talk about? Why would you choose this person and these topics?
2019年度入学試験問題

【数学】

一般入試 A
次の問いに答えよ。
Answer the following questions.

(1) \[ \left( -\frac{3}{4} \right)^2 \div \frac{1}{2} \times \left( -\frac{1}{3^2} \right) \] を計算しなさい。
Calculate the value of \[ \left( -\frac{3}{4} \right)^2 \div \frac{1}{2} \times \left( -\frac{1}{3^2} \right) \]

(2) \[ \frac{3a + 5b}{6} - \frac{2a - 7b}{4} \] を計算しなさい。
Simplify the expression \[ \frac{3a + 5b}{6} - \frac{2a - 7b}{4} \]

(3) \[ \left( -\frac{2}{3}xy^2 \right)^2 \div \frac{4}{3}x^3y^5 \times (-6xy^2) \] を計算しなさい。
Simplify the expression \[ \left( -\frac{2}{3}xy^2 \right)^2 \div \frac{4}{3}x^3y^5 \times (-6xy^2) \]

(4) \[ \frac{3\sqrt{2} - 2\sqrt{3}}{\sqrt{6}} \] を計算しなさい。
Calculate the value of \[ \frac{3\sqrt{2} - 2\sqrt{3}}{\sqrt{6}} \]

(5) \[ \left( 2 - \sqrt{5} \right) \left( 9 + 4\sqrt{5} \right) \] を計算しなさい。
Calculate the value of \[ \left( 2 - \sqrt{5} \right) \left( 9 + 4\sqrt{5} \right) \]
(1) $a$ の 4 倍と $b$ の 3 倍の和が $c$ の 2 倍となるとき，$b$ を $a$ と $c$ を用いて表しなさい.
Express a variable “$b$” in terms of two variables “$a$” and “$c$” if the sum of four times “$a$” and three times “$b$” equals two times “$c$”.

(2) $a = \sqrt{3} + 1$ のとき，$a^2 - 3a + 2$ の値を求めなさい.
Calculate the value of $a^2 - 3a + 2$, if $a = \sqrt{3} + 1$.

(3) $x(x + 2) + (x - 1)^2$ を計算しなさい.
Simplify the expression $x(x + 2) + (x - 1)^2$
Factorize the following expressions.

1. $x^2 - x - 42$

2. $9ax^2 + 24axy + 16ay^2$

3. $(x^2 - 2xy + y^2) - 6(x - y) + 9$
Find the unknown variables in each of the following equations.

(1) \(1.2(0.5x - 1) - 0.9(x - 2) = -x\)

(2) \[
\begin{align*}
\frac{1}{3}x - \frac{1}{4}y &= \frac{3}{2} \\
x + 2.5y &= -2
\end{align*}
\]

(3) \((x + 1)(x - 5) + 2x + 2 = 0\)

(4) \(x^2 + 4x - 2 = 0\)
1から6のどの目も等しい確率で出るサイコロを2回投げて，出た目の積が24以上になる確率を求めなさい。
If one ordinary die is thrown two times, what is the probability that the product of the two numbers shown is greater than or equal to 24? (Note: An ordinary die is numbered from 1 to 6.)

$y$は$x$に比例し，$x=3$に対応する$y$の値が$y=2$であるとき，$y=5$に対応する$x$の値を求めなさい。

Suppose $y$ is proportional to $x$ such that when $x=3$, $y=2$. Find the value of $x$ when $y=5$. 

7 \[ A = x + 2y, \quad B = 2x - y \] のとき, \[ AB - A^2 \] を計算し, \[ x, \ y \] で表しなさい.

If \[ A = x + 2y \quad \text{and} \quad B = 2x - y \], express \[ AB - A^2 \] in terms of \[ x, \ y \].

8 ある液体が入っている容器がある。入っている液体の \[ \frac{1}{3} \] を捨てると、残った液体と容器をあわせた質量は 1120g であった。さらに容器に残っていた液体の \[ \frac{1}{3} \] を捨てると、残った液体と容器をあわせた質量は、最初に入っていた液体と容器をあわせた質量の半分であった。最初に入っていた液体の質量は何 g か。

There is some liquid in a container. After pouring 1/3 of the liquid out of the container, the weight of the remaining quantity, plus that of the container, is 1120g. Then, you again pour out 1/3 of the remaining liquid, and the total weight of the container and the liquid remaining inside is half the weight of the original quantity of the liquid plus the container. How much did the original quantity of liquid weigh?
平面上の4点O, A, B, Cは\( OA = OB = OC = 1 \)を満たす. \( O \)が線分AB上にあり, \( BC = CA \)のとき, \( \triangle ABC \)の面積はいくらか.

O, A, B and C are four points which lie on the same plane such that \( OA = OB = OC = 1 \). Find the area of the \( \triangle ABC \) if \( O \) lies on the line segment AB and \( BC = CA \).

\( \triangle ABC \cong \triangle DEF \)で\( \triangle ABC \)と\( \triangle DEF \)の相似比が4:5であるとする. \( \triangle ABC \)の面積が64であるとき, \( \triangle DEF \)の面積を求めなさい.

Two triangles \( \triangle ABC \) and \( \triangle DEF \) are similar and the sides of \( \triangle ABC \) are proportional to the sides of \( \triangle DEF \) at a ratio of4:5. If the area of \( \triangle ABC \) is 64, what is the area of \( \triangle DEF \)?
11 縦2、横3の長方形ABCDを、右図のように6つの正方形に分けて、AEとEFを結んだ。
\[ \angle DAE + \angle CFE \] は何度になるか求めなさい。
ABCD is a rectangle consisting of 6 congruent squares as shown in the opposite figure. If two line segments AE and EF are drawn, find the value of \[ \angle DAE + \angle CFE \].

12 2次関数 \[ y = ax^2 \ (a \neq 0) \] において、\( x \)が-2から1まで変化するときの変化の割合が-1であるとき、\( a \)の値を求めなさい。

Given the quadratic function \( y = ax^2 \ (a \neq 0) \), the average rate of change from \( x = -2 \) to \( x = 1 \) is -1. Find the value of \( a \).
As shown in the opposite diagram, a line segment “l” of a slope of 2 intersects with the parabolic function $y = x^2$ at A, B. Another line segment “m” which is parallel to “l” intersects with the parabolic function at C, D. Line segment BC is parallel to the x-axis. If the coordinates of A are $(-1, 1)$, answer the following questions.

(1) Find the coordinates of B.

(2) Find the coordinates of D.

(3) Find the equation of line AD.

(4) Find the ratio of the areas of $\triangle ABC$ and $\triangle PCD$ where P is the intersection point of BC and AD.
2019年度入学試験問題

【英語（筆記試験）】
＊リスニングは除く

一般入試 B
I. 次の (1)~(5) の各組の英文 A、B がほぼ同じ意味になるように、空所にふさわしい一語を書きなさい。

(1)
A: I know the tall man. His father works at a bookstore.
B: I know the tall man ( ) father works at a bookstore.

(2)
A: Many children all over the world read the Harry Potter books.
B: The Harry Potter books are ( ) by many children all over the world.

(3)
A: Grace came to Kanazawa in 2015 and still lives here.
B: Grace ( ) lived in Kanazawa since 2015.

(4)
A: When I was younger, I could swim a mile.
B: When I was younger, I was ( ) to swim a mile.

(5)
A: You don’t have to finish your homework tonight.
B: It isn’t ( ) for you to finish your homework tonight.
II. 次の (1) ～ (5) のそれぞれの文の下線 1 ～ 4 のうち、1 つは文法的に間違っています。その番号と訂正した語（一語のみ）を書きなさい。

(1) Hiroshi study math for 3 hours with his friends at his house last Sunday.

(2) Our village is famous for having many snow in the winter.

(3) A box of cookies were given to the girl as a birthday present yesterday.

(4) American people drink most coffee than Japanese people do.

(5) How long do you go to see a movie in a theater? — In a theater? Maybe once a year.
When you think of London, what comes to mind? Maybe you think of Buckingham Palace, black taxis, or red buses. For many people, the most famous symbol of London is the clock popularly known as Big Ben. However, Big Ben is actually the nickname of what is officially called* the Great Bell. The name of the clock tower is Elizabeth Tower.

Big Ben and the clock are usually reliable*, but there were some problems when they were new. When the bell was being tested, in 1856, it cracked*, so a new one had to be made. The second bell was installed* in the tower in 1858, but it also cracked in 1859. Big Ben is 2.2 meters tall, 2.7 meters wide and weighs 13.5 tons. Getting something so heavy up the 96-meter tower requires a lot of effort. Replacing Big Ben with a new bell would not be easy because the clock and its mechanisms are below Big Ben. Instead, engineers spent 3 years taking out a piece of metal from beside the crack*. Then they replaced the hammer for a lighter one that would not damage the bell, and turned Big Ben slightly* so the hammer would not hit the crack. Big Ben still has that crack today.

Since those repairs, Big Ben has chimed* every day, except* for 2 years in World War One and during Winston Churchill’s funeral. However, renovations* on Elizabeth Tower started in August 2017, so Big Ben will be silent for the next 4 years except for special occasions, and London will be a little quieter.

Many people think the ( 1 ) is called Big Ben but that is actually the nickname of the Great Bell. The bell ( 2 ) during testing and again in 1859. It was ( 3 ) to remove the bell for ( 4 ), so it took 3 years to fix. Engineers turned Big Ben and ( 5 ) the hammer, and Big Ben still has a crack. From August 2017, Big Ben will not ( 6 ) every day, but only on special occasions.

<table>
<thead>
<tr>
<th>(a) broke</th>
<th>(b) replaced</th>
<th>(c) little</th>
<th>(d) difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>(e) fixed</td>
<td>(f) clock</td>
<td>(g) without</td>
<td>(h) chime</td>
</tr>
<tr>
<td>(i) repairs</td>
<td>(j) 1856</td>
<td>(k) dropped</td>
<td>(l) palace</td>
</tr>
</tbody>
</table>
IV. 以下の会話文を完成させるため、空欄 1～6 に入る最適な語句を (a)～(h) の中から選び、その記号を書きなさい。（*印のついた語句は注があります。）

Reporter: Hi there. This is World Problems TV program and I am your host, Shota Yamazaki. This week our focus is on pollution and waste. Today, we are on the street looking at ( ) Ah. Here’s a man carrying about four or five of them. Let’s talk to him about that. Excuse me, you’re carrying a lot of plastic shopping bags. Do you always use them?

Man: Yes, they’re very convenient, and most places ( ).

Reporter: That’s true, but nowadays more and more stores are asking customers to pay for bags.

Man: Yes, but they cost almost nothing, so I ( ).

Reporter: Can I ask you what you do with them after you get home with your shopping?

Man: Well, I just throw them away.

Reporter: Did you realize how many of them are thrown away every year? Some are burnt and some are just buried in the ground in landfills*. It’s really ( ).

Man: I’ve heard that, but I’m not too worried about it.

Reporter: But did you know that as the plastic gets older and older, it doesn’t disappear; it breaks up into very small pieces? Scientists have found them everywhere, even ( ).

Man: That sounds really serious. Is there anything we can do about it?

Reporter: Not using so many plastic bags would help.

Man: Oh, yes. I’ve seen reusable* bags sold ( ). I think I can get one of those.

Reporter: Yes, that’s a good idea. Thank you for your time.

注：landfills 埋め立て式のゴミ処理場 reusable 再利用可能な

(a) in supermarkets
(b) bad for the environment
(c) don’t mind that
(d) give them to you for free
(e) in fish and in drinking water
(f) people working in their offices
(g) plastic shopping bags
(h) to pick up trash
Can you believe that an Italian plumber* created by a Japanese artist became one of the most well-known characters in video game history? At the beginning of the 1980s Nintendo was a small company. The company was hoping to make money and become famous by creating fun games, but they couldn’t think of any good ideas.

Usually Nintendo relied on their programmers to think of and create new games. But this was not working. The president* of Nintendo at the time had an unusual idea. He asked one of Nintendo’s artists—Shigeru Miyamoto—to think of a creative idea that would then be given to the programmers to make into a real game. Miyamoto was not a programmer, so he did not think the same way as programmers. He didn’t think about code*, graphics, or hardware*. He started with a story. The story included the main character—Jump Man—his girlfriend, and a pet gorilla. You might know this game better by the name Donkey Kong!

As you can probably guess, Jump Man’s name didn’t remain Jump Man. [彼の名前がどのように変化したかについては言及布田ありょう。] Nintendo sent the original Donkey Kong game to their American headquarters*. The American staff were not impressed, but they started to sell the game and it became very popular. The American branch* of Nintendo was still poor, so sometimes they couldn’t pay the rent for their offices. One day, the landlord* who owned the Nintendo office building showed up. He was angry because they weren’t paying their rent. He asked Nintendo to pay their rent immediately! What was the landlord’s name? Mario! Then, the Nintendo staff gave Jump Man a nickname. They started calling him Mario. Eventually the name caught on and it became part of the character’s and the game’s official title.

Shigeru Miyamoto continued working at Nintendo and he helped create many other world famous games: Legend of Zelda, Star Fox, Pikmin, Wii Sports, and more. All of his success started when the president of Nintendo decided to think differently. Miyamoto knew that great graphics and interesting gameplay were not enough to attract customers. So [his Japanese artist thought of a story and invited the gameplay into the story] by controlling the main character, an Italian plumber named Mario. The rest, as they say, is history.

*plumber 配管工 president 社長
*code コード（データや命令の略字や記号による表現）
*hardware ハードウェア（電子機器装置の総称）
*headquarters 本社
*branch 支社
*landlord 家主
(1) このパッセージのタイトルとして最適なものを、以下の (a)～(d) の中から 1 つ選び、その記号を書きなさい。
   (a) Play More Video Games
   (b) The Complete History of Nintendo
   (c) How Super Mario Was Created
   (d) Why Video Games Are Great

(2) 下線部(a)の日本文になるように、以下の単語を並び替えなさい。ただし、文頭で始まる語も小文字で始めています。
   (a) [ about / changed / there / name / is / his / a story / how ]

(3) 下線部(b)を日本語にしなさい。ただし、this Japanese artist が具体的に誰かを明示すること。

(4) 波線の付いている(1)～(10)の単語を、同じような意味を持つ、別の単語に書き換えなさい。与えられた文字で始め、指定された文字数で書くこと。（指定された文字数は与えられた文字を含まない）過去形の単語は過去形で表すこと。

   (1) m_ _ _ _ _ _ (3)
   (2) f_ _ _ _ _ _ _ _ _ (5)
   (3) l _ _ _ _ _ _ _ _ _ _ _ (5)
   (4) d _ _ _ _ _ _ _ _ _ _ _ (7)
   (5) s _ _ _ _ _ _ _ _ _ (3)
   (6) f_ _ _ _ _ _ _ _ _ (4)
   (7) b _ _ _ _ _ _ _ _ _ (4)
   (8) c _ _ _ _ _ _ (4)
   (9) n _ _ _ _ _ _ _ _ _ _ (2)
   (10) k_ _ _ _ _ _ _ _ _ (3)

(5) 誰が何をした時に、ミヤモト氏の成功は始まりましたか。その答えに該当する英文をパッセージから抜き出しなさい。

(6) パッセージの内容と一致している文を、以下の (a)～(f) の中から 2 つ選び、その記号を書きなさい。
   (a) Nintendo was a big company before Donkey Kong was sold.
   (b) Mario and Donkey Kong were created by an artist.
   (c) Nintendo always used artists to think of ideas for games.
   (d) Nintendo had lots of good ideas for games in the early 1980s.
   (e) Miyamoto thought a good story would interest players.
   (f) The landlord’s nickname was Jump Man.