配付用

2026 年度　武蔵大学　国際教養学部　経済経営学専攻
総合型選抜入学試験
帰国生徒対象入学試験

試験日：2025 年 10 月 12 日（日）
試験時間：9 時 20 分～11 時 00 分（100 分）

英語論述問題の注意事項
(1) 解答用紙の行数が足りなくなった場合は、新しい用紙を渡しますので、挙手してください。

数学問題の注意事項
(1) 解答欄には答だけでなく、考え方や途中式も記載してください。
(2) 問題の□には、符号（－、±）または数字（0～9）が入ります。
(3) 答が y=x で、問題文に y=□x+□ と示されている場合は、最初の□に 1、2 つ目の□に 0 が入ると考えます。解答欄には、y = x と記入しても構いません。

英語論述問題

Carefully read the article below and write an essay in English following the instruction.

Renewable energy* as a source of electricity generation in Japan has had ups and downs since the early 20th century, with the current biggest renewable sources being hydroelectric and solar power. As concerns over global warming increase, what challenges does Japan face in expanding its use of renewable energy?

Hydroelectric electricity provided close to 100% of all the electricity in Japan until the 1950s and it remains an important and popular source of electricity in Japan; certain dams, like the Kurobe Dam built in 1963, are even popular tourist attractions. It's not surprising that Japan has always used a lot of hydroelectricity, as a country with a lot of mountains and rivers, building dams to create reservoirs was relatively cheap and easy. Japan's traditional strength in civil engineering also probably helped. However, most of the best places to put dams were used in the first half of the 20th century, meaning that to build new dams would often require inundating areas of natural beauty**.

This lack of good places to develop dams and the need to quickly increase the amount of electricity available made Japan change the way it generated electricity around the 1960s. By 2010, only around 8% of electricity was coming from hydropower, a percentage that has not changed since then, and almost all energy was either from hydropower, nuclear power, or fossil fuels (coal, oil and gas) in that year.

2010 is also when Japan's use of solar electrical energy started to grow quickly, going

from close to 0% in 2010 to about 10% in 2023. This increase is probably due to the big decrease in costs of solar panels that started around this time and this decrease in cost is expected to continue.

Two important issues remain for solar power in Japan: sunshine and batteries. The amount of sunshine that Japan receives every year is relatively low, meaning that solar power remains more expensive than in other countries like the USA. In addition, for solar power to continue to grow, it needs to be available for use after the sun has set. So many more batteries need to be installed and Japan's expertise in batteries is not as high as some other countries like China. Still, if trends in the cost of solar panels continue, the future solar power seems bright.

Finally, sometimes nuclear power is also called a source of renewable power, as it emits very little CO2 and so does not increase global warming. But it is often the elephant in the room*** for Japan. Starting around the 1970s, nuclear power grew fast as a source of electricity in Japan. Indeed, before the tragedy and devastation of Fukushima, Japan had a very large nuclear power sector, responsible for around 30% of the electricity in Japan.

After the Fukushima disaster and the reports of poor management of nuclear power sector, however, popular support fell dramatically and by 2023 nuclear power produced only around 6% of electricity in Japan. In comparison, renewables that are not solar and hydropower in the same year created around the same amount of electricity, 6%.

Thus, nuclear power is where Japan's biggest dilemma exists. On the one hand, Japan's expertise in nuclear power remains high and the sector has tried to improve itself since 2011. This situation and worries about energy prices and global warming have made support for nuclear power increase in the last few years. But local opposition to nuclear power remains high and worries remain about how well-prepared nuclear power plants are for a big earthquake or tsunami.

* Renewable energy can be defined as a source of energy that comes directly or indirectly (such as rain or wind) via current solar emissions. Most of the time, nuclear power is not considered renewable.

** That is, new dams will create large artificial lakes in areas that will destroy forests and other natural environments.

*** The meaning of the expression "elephant in the room" is that there is something that is big and important, but people find hard to talk about it.

Questions:

(1) Based on what the text says, describe briefly the approximate percentage of electricity that was generated by renewable power in Japan around 1950, 2010 and 2023. How does this answer change if we consider nuclear power also to be a renewable energy?

(2) Choose either hydropower or solar power and then briefly explain one reason Japan uses this energy source a lot and one problem, past or present, it faces or faced using it.

(3) Finally, assume that Japan will increase the amount of renewable energy it uses. Discuss how you think Japan should accomplish this increase; you may include relevant facts not mentioned in the main text for this part, but this is not a requirement.

数　学

I

[1] 2 次方程式$10x^2-19x-15=0$の解は、$x=\frac{\square}{\square},x=-\frac{\square}{\square}$である。

[2]循環小数$0.\dot{2}0\dot{7}$を分数で表すと$\frac{\square\square}{\square\square\square}$となる。

[3] x についての不等式$x^2+(a+1)x+a+4>0$がすべての実数 x に対して成り立つとき、実数 a の値の範囲は−□<a<□である。

[4] $x\geq 0,y\geq 0,x+y=3$であるとき、$2x^2-y^2+3$の最大値は□□、最小値は□□である。

II

次のデータはあるクラスに属する全 8 人の数学のテストの得点データである。

20　40　50　50　60　80　90　90

(1) 数学のテストの得点の中央値は□□である。

(2) 数学のテストの得点の平均値は□□である。

(3) 数学のテストの得点の分散は□□□、標準偏差は□$\sqrt{\square\square}$である。

III

[1] ある工場は 1 週間に平均 2.43 トンの廃棄物を排出し、その標準偏差は 0.88 であることがわかっている。この工場がある 1 週間に排出する廃棄物が 3 トン以上となる確率は□□.□%である（必要に応じて問題用紙に添付された正規分布表を用い、小数点以下第 2 位を四捨五入して求めること）。

[2] 1 から 500 までの整数が掛かれた 500 枚のカードから 1 枚引くとき、書かれた整数が 4 の倍数または 5 の倍数である確率は$\frac{\square}{\square}$である。

IV

[1] 方程式$\log_2(x+2)=\log_4(5x+24)$の解は x=□である。

[2] $\log_{10}2=0.3010$、$\log_{10}3=0.4771$として、以下の問いに答えよ。

(1) $\log_{10}24$の値は□.□□□□である。

(2) 3^nが 10 桁となる自然数 n は□□と□□である。

V

[1] 関数$y=-x^3+9x^2+10$は、x=□で極小値□□を、x=□で極大値□□□をとる。

[2] 座標平面上にある曲線$y=2x^3+3x^2-35x+5$について、傾きが 1 である接線は$y=x+$□□と$y=x-$□□である。

VI

[1] 第 3 項が 28、第 7 項が 448 である等比数列の第 5 項は□□□である。

[2] 初項が 2、公比が 3 である等比数列a_nについて、$\sum_{n=1}^{10}a_n$は□□□□□である。ただし$3^{10}=59049$として計算してよい。

＜添付資料＞

The entries in this table are cumulative probabilities for the standard Normal distribution and give $\Phi(z) = P(Z \leq z)$ for $z \geq 0$. For example, $P(Z \leq 1.96) = 0.9750$.

For values of $z < 0$, use $P(Z \leq z) = 1 - P(Z \leq |z|) = 1 - \Phi(|z|)$. For example,

$$P(Z \leq -1) = 1 - P(Z \leq 1) = 1 - \Phi(1) = 1 - 0.8413 = 0.1587.$$

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990