平成31年度　入学試験問題

医学部（Ⅰ期）

英語・数学

注意事項

1. 試験時間　平成31年1月25日，**午前9時30分から11時50分まで**
2. 配付した試験問題(冊子)，解答用紙の種類はつぎのとおりです。

(1) **試験問題**(冊子，左折り)(表紙・下書き用紙付)

英　語

数　学(その1，その2)

(2) **解答用紙**

英　語　　1枚(上端黄色)(右肩落し)

数　学(その1)　1枚(上端茶色)(右肩落し)

〃　(その2)　1枚(上端茶色)(左肩落し)

3. 下書きが下書き用紙で足りなかったときは，試験問題(冊子)の余白を使用して下さい。
4. 試験開始2時間以降は退場を許可します。但し，試験終了10分前からの退場は許可しません。
5. 受験中にやむなく途中退室(手洗い等)を望むものは挙手し，監督者の指示に従って下さい。
6. 休憩のための途中退室は認めません。
7. 退場の際は，この試験問題(冊子)を一番上にのせ，挙手し，監督者の許可を得てから，試験問題(冊子)，受験票，下書き用紙および所持品を携行の上，退場して下さい。
8. 試験終了のチャイムが鳴ったら，直ちに筆記をやめ，おもてのまま上から解答用紙〔英語，数学(その1)，数学(その2)〕，試験問題(冊子)の順にそろえて確認して下さい。確認が終っても，指示があるまでは席を立たないで下さい。
9. 試験問題(冊子)はお持ち帰り下さい。
10. 監督者退場後，試験場で昼食をとることは差支えありません。ゴミ入れは場外に設置してあります。
11. 午後の集合は1時です。

平成 31 年 1 月 29 日

受験生の皆様へ

昭和大学

平成 31 年度医学部一般選抜入試Ⅰ期一次における出題ミスについて（お知らせ）

平成 31 年 1 月 25 日に実施致しました医学部一般選抜入試Ⅰ期一次の「数学」において出題ミスがありました。
受験生の皆様には大変ご迷惑をおかけ致しましたこと心よりお詫び申し上げます。
この件につきましては、下記の通り対応致します。なお、本学と致しましては、この度の出題ミスを充分に検証し今後同様の事が起きないよう努めて参ります。

出題ミスの内容

数学　１２ページ　問題２（１）問題文

次の各問いに答えよ。ただし、答えは結果のみを解答欄に記入せよ。

１から９９までの自然数からなる集合 U とする。以下の問いに答えよ。

（１）Uの要素のうち、100 との最大公約数が１より大きいもの全体からなる集合を V，U の要素のうち偶数個の正の約数をもつものの集合を W とする。AおよびBの部分集合で、次の 2 つの条件を満たすとき、集合Bの要素をすべて求めよ。

(a)　$\bar{A} \cup B = V$　　(b) $\bar{A} \cap \bar{B} = W$

上記問題において、正答が存在しない。

対応内容

当該問題については、正答が存在しないことを確認したため、全員正解扱いとする。

英　語

1 次の各組の単語について，1．～3．は一番強いアクセントの位置が他と異なるものを，4．～5．は下線部の発音が他と異なるものを，それぞれ1つ選び，記号で答えなさい。

1.	A. dip-lo-mat	B. cal-en-dar	C. ref-er-ence
	D. ob-sta-cle	E. pro-ce-dure	
2.	A. rec-om-mend	B. sac-ri-fice	C. in-ter-fere
	D. un-der-stand	E. re-pro-duce	
3.	A. mem-o-ra-ble	B. ad-van-ta-geous	C. hor-i-zon-tal
	D. en-er-get-ic	E. in-flu-en-tial	
4.	A. digestion	B. introduction	C. emotion
	D. option	E. caution	
5.	A. cradle	B. panel	C. compassion
	D. blanket	E. fashion	

2 次の各文の(　　)の中に入れるのに最も適切な表現を1つ選び，記号で答えなさい。

1. There was a call for volunteers to (　　) clean the homes of the flood victims.

A. assist　　B. help　　C. support　　D. lend　　E. make

2. He did not offer me the job. If he had, I (　　).

A. would have accepted
B. would have been accepted
C. had been accepted
D. have accepted
E. would accepted

3. There were 190 votes in (　　) of the motion and 50 against.

A. spite　　B. order　　C. favor　　D. total　　E. agreement

4. He came up (　　) a new idea for increasing sales.

A. to　　B. with　　C. on　　D. by　　E. for

5. It was a crisis for ( ) I was totally unprepared.

A. how B. whether C. what D. that E. which

6. The students in this department ( ) to speak at least one more language besides their native language.

A. are looking forward B. able C. are expected

D. required E. enabled

7. The spokeswoman for the government is used to dealing ( ) the press.

A. in B. with C. over D. out E. for

8. Not until I visited my aunt ( ).

A. was I realized how ill she was

B. I realized how ill she was

C. I did realize how ill she was

D. did I realize how ill she was

E. had I realized how ill she was

9. The authorities have shown no signs of giving ( ) to the terrorists' demands.

A. out B. for C. in D. away E. back

10. In this nation, public littering is very low compared with ( ) in many other countries.

A. some B. one C. that D. which E. it

3 次の各日本文に一致するように語句を並べ替えたときに，(1)～(10)に入る語の記号をそれぞれ答えなさい。

1. 彼女はまもなく現れた。

I ( ) ( ) ( ) (1) (2) ( ) ( ) ( ).

ア．before　イ．she　ウ．had　エ．showed

オ．not　カ．waited　キ．up　ク．long

2. もう少し慎重だったら，彼はだいぶ苦労をしないで済んだのに。

A ( ) (3) ( ) ( ) ( ) (4) ( ) a lot of trouble.

ア．would　イ．spared　ウ．little　エ．him

オ．more　カ．care　キ．have

3. ご迷惑をおかけしていたとしたら，お詫び申し上げます。

I am sorry for (5) ( ) ( ) ( ) ( ) (6) ( ).

ア．caused　イ．any　ウ．I　エ．you

オ．inconvenience　カ．may　キ．have

4. お子さんたちに好きなようにさせてあげたらいかがでしょう？

Why ( ) ( ) (7) ( ) ( ) ( ) ( ) (8)?

ア．as　イ．your children　ウ．don't　エ．please

オ．you　カ．they　キ．let　ク．do

5. 物事はいつも自分の思い通りにいくとは限らない。

Things ( ) (9) ( ) ( ) ( ) ( ) ( ) (10).

ア．them　イ．we　ウ．always　エ．don't

オ．to　カ．the way　キ．want　ク．go

4 次の各文の下線部には誤りが１つあります。その個所を番号で指摘し，訂正しなさい。

1. His book (1) was translated into English and (2) was sold well over a million (3) copies among (4) the young in the US.

2. I make (1) it a rule (2) to see my dentist once (3) every three month to have my teeth (4) checked.

3. I was (1) at loss what (2) to do when I had my handbag (3) stolen while I was (4) on a trip to Hakone.

4. She (1) has worked as a nurse in Tokyo for (2) more than five years (3) before she entered the medical school and (4) became a physician.

5. I missed the train this morning and was late (1) for school (2) by (3) an hour. I (4) should leave the house earlier.

5 次の各対話中の(　あ　)～(　お　)に入れる表現として最も適切なものをそれぞれ選択肢から1つ選び，記号で答えなさい。

［対話1］

Man: What's the matter?

Woman: I'm trying to send a message, but I keep getting errors.

Man: (　あ　). Ah, you have a space before the "at" mark*.

Woman: What?

Man: Take out the space in the address line, (　い　) your mail won't send.

Woman: Oh, I see. Ah, it (　う　)! Thank you, Greg. By the way, how about coffee and sandwiches for lunch?

Man: Sorry. I'm expecting a customer, so I have to stay in the office.

(注) "at" mark　アットマーク《電子メールのアドレスで，ユーザー名とドメイン名の間を区切る記号 ;@》

〔出典：辰巳友昭監修，『究極の英会話(下)』，アルク.〕

(　あ　)

A. Great
B. Let me see
C. I don't think so
D. I'm sorry
E. I don't know

(　い　)

A. and
B. but
C. or
D. until
E. while

(　う　)

A. worked
B. had worked
C. has sent
D. had sent
E. succeeds

［対話２］

Man: His speech was so boring that I almost fell asleep.

Woman: Yeah, as usual.

Man: So, did you manage to pay attention during the whole speech?

Woman: To tell the truth, I fell asleep for at least a few minutes. I was so（ え ）the game on television that I didn't sleep much last night.

Man: Oh. Do you think he noticed?

Woman: Um, when I woke up, our eyes met.

Man: Maybe that's why he looked kind of upset during his speech.

Woman: That was probably my fault. But he's so dull that（ お ）.

〔出典：辰巳友昭監修，『究極の英会話(下)』，アルク.〕

（ え ）

A. into

B. up to

C. absorbed

D. in depth

E. attracted

（ お ）

A. it wouldn't be helped

B. can it be helped

C. I couldn't have helped it

D. I couldn't but help

E. I couldn't help it

6 2018年に日本の予防接種制度について書かれた以下の文章を読んで，後の問いに答えなさい。

[1] The number of people infected by measles* in Japan has already exceeded 100 this year and the total appears to be rising. Those born between 1977 and 1990 have been vaccinated* against measles just once. Experts in infectious diseases say that at least two vaccinations are needed to attain immunity*. That generation has been hit the hardest by measles this time.

[2] (ア) the Health, Labor and Welfare Ministry overhauls* its vaccination policy, measles is likely to become an epidemic* at certain intervals. What the ministry must immediately do is to vaccinate those people who had only one vaccination.

[3] In the (イ) that diseases like measles and rubella* become epidemics, the government has the power to give vaccination shots* to people of all ages by importing vaccines from abroad, outside the framework of regular vaccinations for particular age groups. But the ministry has shown no signs of doing so.

[4] A university professor of medicine says that Japan is more than 10 years behind European and North American countries in its inoculation* policy and his view is widely shared.

[5] Japan has two types of vaccination programs: vaccinations regularly carried out by municipalities and voluntary vaccinations. Although the fees for the regular vaccinations are covered by public funds, the types of vaccinations under this program are limited.

[6] In the United States, publicly funded health care programs cover vaccination against mumps*, hepatitis* A and childhood influenza. In Japan, individuals must pay for the same inoculations. Hepatitis A and influenza could become serious and mumps could result in aftereffects such as hearing impairment and infertility*. The National Institute of Infectious Diseases (NIID)* (ウ) that every year, some 650 people suffer from hearing impairment due to mumps.

[7] Some progress has been made in Japan. After being bitterly criticized for failing to prevent the 2009 flu pandemic, the health ministry has expanded the scope of vaccinations whose costs are covered by public funds including haemophilus influenza type b or Hib*, which is different from the virus-caused influenza, in 2013, pneumococcal pneumonia* in 2014 and hepatitis B in 2016.

[8] But the ministry did nothing to help those who had not been vaccinated prior to the vaccination expansion. Therein lies the root cause of the latest measles outbreak. Although the ministry started a policy of inoculating people twice with a combination vaccine against measles and rubella (the MR vaccine) in 2006, prior generations were left out and measles is now playing havoc with* them. The situation is the same for rubella. If a pregnant woman is infected with the disease, it could directly (エ) a miscarriage* or an inborn deformity*.

[9] That only a small number of diseases are covered by the regular vaccination programs is not the only problem. Another issue is that a relatively small percentage of people receive such vaccinations. The NIID's 2016 survey showed that only 83 percent of 7-year-old children were inoculated twice with the MR vaccine. Of the 2-year-old children born in the year when the Immunization Law-based vaccination against chickenpox* was introduced, a mere 52 percent had received two shots — far below the 95 percent rate required for ensuring mass immunity*.

[10] The health ministry is to blame also for these low inoculation rates. Newborn babies are required by law to be inoculated with seven types of vaccines before turning 1. This puts a heavy burden on parents, who have to take their babies to clinics at least seven times for a total of 19 shots. (オ), if they miss the tight inoculation schedule, they will have to bear the vaccination costs.

[11] To relieve parents of the burden, combination vaccines have been developed in other countries. The U.S. in 2002 certified a combination vaccine against tetanus*, diphtheria*, whooping cough*, hepatitis B and polio* and in 2005, another combination vaccine against measles, rubella, mumps and chickenpox. Such vaccines can reduce the number of required shots and greatly lighten the burden of both parents and children.

[12] The health ministry must increase the stock of vaccines and improve inoculation rates, including (1)those for people who missed inoculations in the past. Reforming the current inoculation system, which treats citizens' health as something (2)of secondary importance, would be a quick remedy for Japan's status as a backward country* when it comes to vaccination policy.

("Japan's backward vaccination policy" 2018.6.26, Japan Times(一部改編))

NOTES

measles　はしか　　vaccinate　ワクチン接種をする

immunity　免疫(性)　　overhaul　徹底的に見直す　　epidemic　流行

rubella　風疹　　shot　皮下注射　　inoculation　(予防)接種

mumps　おたふくかぜ　　hepatitis　肝炎　　infertility　不妊

the National Institute of Infectious Diseases (NIID)　国立感染症研究所

haemophilus influenza type b (Hib)　ヒブ感染症

pneumococcal pneumonia　肺炎球菌性肺炎

play havoc with …　…に猛威をふるう

miscarriage　流産　　inborn deformity　先天性の奇形

chickenpox　水ぼうそう　　mass immunity　集団免疫　　tetanus　破傷風

diphtheria　ジフテリア　　whooping cough　百日咳　　polio　小児麻痺

backward country　後進国

1. 本文中の(　ア　)～(　オ　)に入る最も適切なものを，それぞれA．～E．の中から1つ選び，記号で答えなさい。

(　ア　)　A．Nevertheless　B．If only　C．Unless
D．Despite　E．In fact

(　イ　)　A．part　B．opportunity　C．possibility
D．event　E．turn

(　ウ　)　A．approves　B．estimates　C．implies
D．realizes　E．considers

(　エ　)　A．result　B．come to　C．turn out
D．bring up　E．lead to

(　オ　)　A．Moreover　B．Thus　C．For instance
D．In contrast　E．Similarly

2. [8]に記述された内容に基づいて，今回のはしかの流行の根本的な原因を日本語で80文字以内にまとめなさい。

3. [12]の下線部(1)が指すものを本文より英語で抜き出して書きなさい。

4. [12]の下線部(2)の語句の意味として最も適切と思われるものをA．～E．中から1つ選び，記号で答えなさい。

A．that comes after the first in time or order

B．that you cannot avoid or prevent

C．that is not as important as other issues

D．that happens as a result of a previous incident

E．that is extremely important

5. 次の中から本文の内容に合っているものを3つ選び，記号で答えなさい。

A．According to the reading, those born between 1977 and 1990 are most severely hit by measles this year.

B．The author of the reading thinks that the presence of those who have never been vaccinated against measles can cause the outbreaks of measles at certain intervals in Japan.

C．The Health, Labor and Welfare Ministry imported vaccines from abroad to stop the current epidemic of measles.

D．Very few experts think that Japan is a decade behind European and North American countries in its inoculation policy.

E．Most of the vaccines are covered by public fund and given by the local government of cities and towns in Japan.

F．Individuals must pay for the vaccination for mumps, hepatitis A and childhood influenza in the US.

G．The number of the vaccinations that are covered by public fund increased after the 2009 flu pandemic in Japan.

H．Combination vaccines proved to be an effective remedy for overcoming low inoculation rates in Japan because they lessen the burden of parents.

I．The author thinks that the Health, Labor and Welfare Ministry should make efforts to vaccinate those people who had been vaccinated only once in the past.

数　学（その１）

1 次の各問いに答えよ。ただし，答えは結果のみを解答欄に記入せよ。

複素数平面上の点 $z_0 = x_0 + iy_0$ を考える。また z_0 を極形式で表した場合の絶対値を r，偏角を θ_0 とし，θ を $0 < \theta \leq \frac{\pi}{2}$ である定数とする。原点 O を中心とし，点 z_0 を正の向きに角 θ(ラジアン)回転させた点とOを結ぶ線分を１：２に内分する点を $z_1 = x_1 + iy_1$ とする。次に O を中心とし，点 z_1 を正の向きに角 θ 回転させた点とOを結ぶ線分を１：２に内分する点を $z_2 = x_2 + iy_2$ とする。以下同様にし，点 $z_n = x_n + iy_n$ を定める。このとき，次の問いに答えよ。

(1) z_n を r，θ_0，θ および n を用いて表せ。

(2) $z_{n+1} - z_n = t(z_1 - z_0)$ (t は実数)となるような正の整数 n があるとき，n を求めよ。

(3) z_0，z_1，…，z_n の実部を x 座標，虚部を y 座標とした xy 平面上の点を $P_0(x_0, y_0)$，$P_1(x_1, y_1)$，…，$P_n(x_n, y_n)$ とする。$\triangle P_nP_{n+1}P_{n+2}$ の面積を S_n とするとき，無限級数 $\sum_{n=0}^{\infty} S_n$ の和を r，θ を用いて表せ。

2 次の各問いに答えよ。ただし，答えは結果のみを解答欄に記入せよ。

1から99までの自然数からなる集合をUとする。以下の問いに答えよ。

(1) Uの要素のうち，100との最大公約数が1より大きいもの全体からなる集合をV，Uの要素のうち偶数個の正の約数をもつものの集合をWとする。AおよびBがUの部分集合で，次の2つの条件を満たすとするとき，集合Bの要素をすべて求めよ。

(a) $\overline{A} \cup B = V$　　(b) $\overline{A} \cap \overline{B} = W$

(2) Uの要素から重複せず50個の要素を取り出した集合をXとする。Xの作り方がx通りあるとするとき，xの約数のうち，3^a(aは自然数)の形で表せる数で最大のものを求めよ。

(3) Uの要素のうち，正の約数の個数が100の正の約数の個数よりも大きい要素はいくつあるか。また，そのうち正の約数の和が100の正の約数の和よりも大きくなる要素nをすべて求めよ。

数　学（その２）

3 次の各問いに答えよ。ただし，答えは結果のみを解答欄に記入せよ。

(1)　$3x + 7y = 2019$ を満たす自然数 x，y の組 (x, y) は全部で何個あるか求めよ。

(2)　２つの３次関数

$f(x) = x^3 + 3x^2 - 1$ と $g(x) = x^3 + ax^2 + bx + c$ がある。

方程式 $f(x) = 0$ の解を α，β，γ とするとき，方程式 $g(x) = 0$ の解は α^2，β^2，γ^2 である。

a，b，c の値をそれぞれ求めよ。

(3)　１つのサイコロを投げることをくり返し，出た目の和が５以上になったら終わることにする。

(3-1)　１回投げて終わる確率を求めよ。

(3-2)　２回投げて終わる確率を求めよ。

(3-3)　終わるまでに投げる回数の期待値（平均値）を求めよ。

4 次の各問いに答えよ。ただし，答えは結果のみを解答欄に記入せよ。

(1)

$$f(x)=\frac{\cos x}{1+\sin x}$$

のとき，$f'\left(\frac{\pi}{6}\right)$を求めよ。

(2) 曲線$|\log_3 x|+|\log_3 y|=2$で囲まれる図形の面積を求めよ。

(3)

$$\begin{cases} x=(1+\cos\theta)\cos\theta \\ y=(1+\cos\theta)\sin\theta \end{cases} \qquad (-\pi \leqq \theta \leqq \pi)$$

をx軸のまわりに回転させてできる回転体の体積を求めよ。