

試験科目	英語 I
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受験番号	
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**Diabetes** (糖尿病) is a disease in which the (A) concentration in the blood remains high for a long time, and is caused by a deficiency of the (B) called insulin compared to the (A) in the blood. Depending on the cause of onset, it can be broadly classified into two types.

Type 1 diabetes develops when the cells in the (C) that secrete insulin are destroyed by an autoimmune disease, resulting in a lack of insulin. It is common in children and young people. We still don't know the main cause of this disease but it is thought that the condition may develop when a person is genetically unable to produce insulin or when the cells in the (C) that produce insulin are destroyed for some reason. Type 2 diabetes develops as a result of a combination of environmental factors such as diet and constitution (genetics). Characteristics of people who are prone to developing type 2 diabetes include being overweight, having bad eating habits, having a family history of diabetes, and being over 40 years old.

### How to prevent and treat diabetes

It is difficult to cure diabetes completely, and once it develops, you will need to continue regular visits to the (D) and treatment. Below, we will explain how to prevent and treat diabetes.

#### 【Diet therapy】

##### **Appropriate amount of food**

It is important to understand the amount of food necessary for daily life and not to eat more than that. The appropriate amount of food for each person varies depending on "age, sex, physique, frequency of exercise, and constitution", so consult with a doctor or other specialist to decide.

##### **Maintain a balanced diet**

In addition to maintaining the appropriate amount of food, it is also important to consume nutrients without excess or deficiency. Let's consume a balanced amount of the five major nutrients (carbohydrates, protein, lipids, vitamins, and minerals).

##### **Reduce salt intake**

It is also important to prevent high blood pressure, so be conscious of limiting salt intake. The recommended salt intake is less than 8g per day for men and less than 7g for women. Using this salt amount as a reference, try to reduce salt intake as much as possible.

#### 【Exercise therapy】

##### **Aerobic exercise • Strength training**

Aerobic exercise is exercise that involves continuous long-term physical activity, such as (E). The recommended frequency of exercise is 150 minutes or more per week, at least three times a week. Strength training that focuses on large muscles such as the legs, hips, and back is recommended. It is recommended to do strength training that uses the whole body, about 10 times per set, two to three times a week.

#### 【Drug therapy】

##### **Oral medications**

When blood sugar levels do not decrease through diet and exercise alone, doctors use medication as a last resort. Several oral medications make insulin easier to secrete and more effective, suppress sugar absorption, and increase excretion.

##### **Injectable medications**

Injectable medications are called insulin injections. By injecting insulin to supplement the insulin that is lacking in the body, the amount of sugar in the blood is controlled.

Diabetes is a disease that requires control of blood sugar levels throughout a person's life. There may be no symptoms at first, and the disease may progress without you noticing. If it worsens, it can lead to various complications, so if you find out that your blood sugar level is high during a health check, don't ignore it, and instead work on prevention and treatment.

問 1 文中の(A)～(E)に当てはまる語句を(a)～(e)より 1 つ選びなさい。

- (A) : (a) glucose (b) calcium (c) NaCl (d) water (e) protein
- (B) : (a) hormone (b) fruits (c) inorganic material (d) water (e) toxin
- (C) : (a) kidney (b) liver (c) gallbladder (d) stomach (e) pancreas
- (D) : (a) hospital (b) school (c) supermarket (d) sanctuary (e) pharmacy
- (E) : (a) gambling (b) eating (c) cheating (d) sleeping (e) jogging

(A) : (a)	(B) : (a)	(C) : (e)	(D) : (a)	(E) : (e)
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問 2 本文に照らし合わせて、正しい選択肢を 4 つ選びなさい。

- (A) : It is important to eat moderately
- (B) : To prevent diabetes, you only need to reduce a sugar consumption
- (C) : Most cases, diabetes are healed naturally
- (D) : Type I diabetes is common in the elderly
- (E) : The cause of diabetes is still unclear
- (F) : Excessive salt intake can also cause diabetes
- (G) : Appropriate food amounts are equal regardless of gender or age
- (H) : The most effective treatment is to use drugs from the beginning
- (I) : Once you have diabetes, you may have to live with it for the rest of your life
- (J) : Diabetes presents a variety of symptoms from the early stages of the disease
- (K) : Oral medications are more effective than insulin injections

(A)	(E)	(F)	(I)
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問 3 II 型糖尿病を発症しやすい人の特徴を、本文に即して日本語で簡潔に説明しなさい。

年齢は40歳以上で、太っていて食習慣が悪く、糖尿病の家族歴を有する者。

経口治療薬の効果を本文に即して答えなさい。

The (A) are small organs. The main role of the (A) is to produce urine, which is to excrete from the body what humans ingest or metabolize in daily life and no longer need to maintain the quantity and quality of body fluids, that is, to maintain homeostasis of body fluids. In the (A), blood is filtered by glomeruli to produce primitive urine, and then the renal tubules reabsorb what is (B) and secrete what is (C) to produce terminal urine. This set of glomeruli and tubules is the nephron. There are about 1 million nephrons in one (A), for a total of about 2 million. A large amount of blood flows to the kidneys, about 1,000 mL per minute, which is equivalent to about 20% of cardiac output. (D)No other organ receives this much blood flow. About 99% of the primitive urine filtered by the glomeruli is reabsorbed, and only about 1 mL/min 「(E) mL/day)」 is actually excreted as urine. In other words, the (A) filter a large amount of blood (about 150 liters) a day to produce the primitive urine, and about 99% of it is

also reabsorbed. This means that the entire body fluid is filtered about four times a day, and most of it is taken back into the body and about (F) % are excreted as terminal urine. Why is such a seemingly wasteful thing done? The amount of water and electrolytes consumed by humans is not always constant, and may be high or low. Many of you have probably experienced binge eating. But that didn't stop there. I may have had an upset stomach and a hangover, but my fluid electrolytes were almost non-existent. Isn't this actually amazing?

(G) Since body fluids need to be constant in order to maintain homeostasis, this enormous amount of glomerular filtration acts as a safeguard, making room for reabsorption when necessary and excretion when not needed. In other words, this system makes it possible for humans to maintain a constant water-electrolyte balance in the body, no matter how much water or electrolytes they ingest, or how little they consume.

問 4 (A)に当てはまる語句を英語で答えなさい。

kidney

問 5 (B)と(C)に当てはまる語句の正しい組み合わせに丸をなさい。

(B) necessary	(B) heavy	(B) hot	(B) old	(B) big
(C) unnecessary	(C) light	(C) cold	(C) new	(C) small

問 6 二重下線部(D)を日本語に訳しなさい。

これだけ多くの血流を受ける臓器はほかにはない。(別解 腎臓が最も多くの血流を受ける臓器である)

問 7 (E)に入る数字を答えなさい。

1440

問 8 (F)に入る数字を答えなさい。

1

問 9 下線部(G)を日本語に訳しなさい。

体液は恒常性の維持のために一定である必要があるため、これほどまでの膨大な糸球体濾過量がセーフガードとなって、必要なら再吸収し、不要なら排泄する余裕(余力)をつくっている。

評 点	
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1. 以下の英文を読んで、1)～3)に答えなさい。

There may be biological risks of dental implant related...

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...reduce the degree of technical complexity along with functional decline and morbidity.

Source: Clin Oral Implants Res. 2017 Aug;28(8):920-930. Partially modified

1) 文中で示す高齢者のオッセオインテグレーションに対する生物学的リスクを2つ、和訳して書きなさい。(6点)

- ① 骨代謝の低下
- ② 免疫防御力の弱体化

2) 文中で示す高齢者の口腔衛生不良に対するリスクを3つ、和訳して書きなさい。(9点)

- ① ポリファーマシーによる口渇が引き起こす自浄機能低下
- ② 視力、触覚、器用さの低下によるバイオフィルム除去のための手技の低下
- ③ 義歯の取り外し困難となることで、義歯により生じる衛生不良

3) 下線部を和訳しなさい。(10点) (裏面も使用可)

高齢者にとって、高度なアタッチメントシステムが使用される義歯の管理は特に困難な場合がある。  
機能的・認知的が損なわれるに従い、高齢者は日常生活において介護者からの支援にますます依存するようになるだろう。残念ながら、看護スタッフは多くの場合、インプラント義歯の取り扱いとそれに伴う口腔衛生管理について十分な訓練を受けていない。

II 以下の英文を読んで、1)～3)に答えなさい。

‘Can caries be eradicated?’ A simple answer against …

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in particular overweight and diabetes.

<sup>1</sup>microbaiota 微生物叢      <sup>2</sup>dysbiosis 微生物叢のバランスの乱れ

1) 齲蝕病原性細菌が Koch の原則を満たしていない例として示した文章を以下に訳しなさい。（12点）

一般的に齲蝕の病原菌に分類される、例えば *Streptococcus mutans* などは、齲蝕のない者にも高頻繁に存在し、齲蝕病変から分離された総細菌群の 1%未満を占めるに過ぎない。

2) 1) で選んだ文章が反しているのは Koch の 4 原則のどれに該当するか、番号（①～④）で解答しなさい。

（3 点）

- ① 特定の微生物が罹患したすべての生物に豊富に存在し、健康な生物からは見つからないこと
- ② その微生物が罹患した生物から単離され純粋培養で増殖できること
- ③ 分離した微生物を健康な生物に接種すると同じ病気を起こすこと
- ④ その微生物は接種されて発病した生物から再単離され、元の原因菌と同一であると同定されること

解答    ①

3) 下線部を和訳しなさい。（10 点）（裏面も使用可）

齲蝕にとっての微生物叢のバランスの乱れは、酸の産生だけではなく、年齢、遺伝、生活習慣、行動、食事、社会経済など、生物学的及び非生物学的な要因といえる。そのため、国際歯科連盟（FDI）は齲蝕を他の多くの非感染性疾患とリスクを共有する非感染性疾患と定義しており、特に肥満や糖尿病との関連が指摘されている。

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