摂南大学 薬学研究科医療薬学専攻　博士課程
２０２６年度 一般入学試験＜第１回＞
２０２５年度秋入学試験問題

科目名	外　国　語《英　語》	問題番号	1	受験番号	

※選択した問題には○印、選択しなかった問題には×印を記入してください。

【Ｎｏ．１－Ａ】

---------- 切り取り線 ----------

【Ｎｏ．１－Ａ】

問　次の英文を和訳しなさい。

The total amount of potassium in the body is approximately 3000-4000 mEq. About 98% of this is present within the cells. In contrast, most of the sodium exists extracellularly. Such a balance is essentially maintained by transporting potassium into and sodium out of the cells by sodium pump, respectively. As a result, its concentration inside the cell is about 140 mEq/L, while it is only 4 mEq/L outside the cell. Plasma is an extracellular fluid, and therefore the serum potassium concentration is approximately 4 mEq/L. This concentration hardly changes even if potassium is ingested through meals. First, the ingested potassium is taken up intracellularly, so does not increase plasma concentrations. Then, it is excreted in the urine in stages. Insulin and adrenaline promote the uptake of potassium into cells through activation of sodium pumps, and aldosterone promotes the sodium-potassium exchange system in the distal tubules to promote potassium excretion out of the body. Hyperkalemia occurs when the regulatory functions are disrupted. Elevated extracellular potassium concentrations have profound effects on excitable cells, especially muscle cells. This is because potassium concentration affects the degree of the resting membrane potential of excitable cells and the repolarization of action potentials. Hyperkalemia can cause muscle weakness in skeletal muscles and conduction disorders such as arrhythmias and cardiac arrest in myocardium.

hyperkalemia　高カリウム血症
resting membrane potential　静止膜電位
repolarization　再分極
arrhythmias　不整脈

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【Ｎｏ．１－Ｂ】

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【Ｎｏ．１－Ｂ】

問　次の英文を和訳しなさい。

The total amount of potassium in the body is approximately 3000-4000 mEq. About 98% of this is present within the cells. In contrast, most of the sodium exists extracellularly. Such a balance is essentially maintained by transporting potassium into and sodium out of the cells by sodium pump, respectively. As a result, its concentration inside the cell is about 140 mEq/L, while it is only 4 mEq/L outside the cell. Plasma is an extracellular fluid, and therefore the serum potassium concentration is approximately 4 mEq/L. This concentration hardly changes even if potassium is ingested through meals. First, the ingested potassium is taken up intracellularly, so does not increase plasma concentrations. Then, it is excreted in the urine in stages. Insulin and adrenaline promote the uptake of potassium into cells through activation of sodium pumps, and aldosterone promotes the sodium-potassium exchange system in the distal tubules to promote potassium excretion out of the body. Hyperkalemia occurs when the regulatory functions are disrupted. Elevated extracellular potassium concentrations have profound effects on excitable cells, especially muscle cells. This is because potassium concentration affects the degree of the resting membrane potential of excitable cells and the repolarization of action potentials. Hyperkalemia can cause muscle weakness in skeletal muscles and conduction disorders such as arrhythmias and cardiac arrest in myocardium.

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【Ｎｏ．１－Ｃ】

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【Ｎｏ．１－Ｃ】

問　次の英文を和訳しなさい。

The total amount of potassium in the body is approximately 3000-4000 mEq. About 98% of this is present within the cells. In contrast, most of the sodium exists extracellularly. Such a balance is essentially maintained by transporting potassium into and sodium out of the cells by sodium pump, respectively. As a result, its concentration inside the cell is about 140 mEq/L, while it is only 4 mEq/L outside the cell. Plasma is an extracellular fluid, and therefore the serum potassium concentration is approximately 4 mEq/L. This concentration hardly changes even if potassium is ingested through meals. First, the ingested potassium is taken up intracellularly, so does not increase plasma concentrations. Then, it is excreted in the urine in stages. Insulin and adrenaline promote the uptake of potassium into cells through activation of sodium pumps, and aldosterone promotes the sodium-potassium exchange system in the distal tubules to promote potassium excretion out of the body. Hyperkalemia occurs when the regulatory functions are disrupted. Elevated extracellular potassium concentrations have profound effects on excitable cells, especially muscle cells. This is because potassium concentration affects the degree of the resting membrane potential of excitable cells and the repolarization of action potentials. Hyperkalemia can cause muscle weakness in skeletal muscles and conduction disorders such as arrhythmias and cardiac arrest in myocardium.

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【Ｎｏ．１－Ｄ】

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【Ｎｏ．１－Ｄ】

問　次の英文を和訳しなさい。

The total amount of potassium in the body is approximately 3000-4000 mEq. About 98% of this is present within the cells. In contrast, most of the sodium exists extracellularly. Such a balance is essentially maintained by transporting potassium into and sodium out of the cells by sodium pump, respectively. As a result, its concentration inside the cell is about 140 mEq/L, while it is only 4 mEq/L outside the cell. Plasma is an extracellular fluid, and therefore the serum potassium concentration is approximately 4 mEq/L. This concentration hardly changes even if potassium is ingested through meals. First, the ingested potassium is taken up intracellularly, so does not increase plasma concentrations. Then, it is excreted in the urine in stages. Insulin and adrenaline promote the uptake of potassium into cells through activation of sodium pumps, and aldosterone promotes the sodium-potassium exchange system in the distal tubules to promote potassium excretion out of the body. Hyperkalemia occurs when the regulatory functions are disrupted. Elevated extracellular potassium concentrations have profound effects on excitable cells, especially muscle cells. This is because potassium concentration affects the degree of the resting membrane potential of excitable cells and the repolarization of action potentials. Hyperkalemia can cause muscle weakness in skeletal muscles and conduction disorders such as arrhythmias and cardiac arrest in myocardium.

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【Ｎｏ．１－Ｅ】

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【Ｎｏ．１－Ｅ】

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【Ｎｏ．１－Ｆ】

---------- 切り取り線 ----------

【Ｎｏ．１－Ｆ】

問　次の英文を和訳しなさい。

The total amount of potassium in the body is approximately 3000-4000 mEq. About 98% of this is present within the cells. In contrast, most of the sodium exists extracellularly. Such a balance is essentially maintained by transporting potassium into and sodium out of the cells by sodium pump, respectively. As a result, its concentration inside the cell is about 140 mEq/L, while it is only 4 mEq/L outside the cell. Plasma is an extracellular fluid, and therefore the serum potassium concentration is approximately 4 mEq/L. This concentration hardly changes even if potassium is ingested through meals. First, the ingested potassium is taken up intracellularly, so does not increase plasma concentrations. Then, it is excreted in the urine in stages. Insulin and adrenaline promote the uptake of potassium into cells through activation of sodium pumps, and aldosterone promotes the sodium-potassium exchange system in the distal tubules to promote potassium excretion out of the body. Hyperkalemia occurs when the regulatory functions are disrupted. Elevated extracellular potassium concentrations have profound effects on excitable cells, especially muscle cells. This is because potassium concentration affects the degree of the resting membrane potential of excitable cells and the repolarization of action potentials. Hyperkalemia can cause muscle weakness in skeletal muscles and conduction disorders such as arrhythmias and cardiac arrest in myocardium.

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【Ｎｏ．２－Ａ】

切り取り線

【Ｎｏ．２－Ａ】

問　次の英文を和訳しなさい。

Polychlorinated biphenyls (PCBs) are organochlorine compounds with the formula $C_{12}H_{10-n}Cl_n$. Since 1930, PCBs have been utilized commercially as dielectric and heat-exchange fluids as well as in various other applications. PCBs are ubiquitously distributed in the global environment and exhibit persistence and bioaccumulation. Human exposure to PCBs primarily occurs through consumption of contaminated food, inhalation, and dermal absorption in occupational settings. PCBs accumulate in the adipose tissues of humans and other animals where they exert toxicological effects, particularly under conditions of repeated exposure. Pathological manifestations primarily occur in the skin and liver; however, the gastrointestinal tract, immune system, and nervous system are also affected. Polychlorinated dibenzofurans are contaminants of commercial PCB mixtures that contribute significantly to their toxicity. Studies on rodents suggest that some PCB congeners may be carcinogenic and that they can promote the carcinogenicity of other chemicals. PCBs have been analyzed using gas chromatography (GC) techniques with electron capture detection, traditionally employing packed columns. However, more advanced methodologies, such as capillary column GC and GC coupled with mass spectrometry (GC-MS), have been utilized in recent studies. These advancements facilitate the identification of individual congeners, enhance the comparability of analytical data from diverse sources, and provide a foundation for toxicity assessments.

adipose　脂肪
manifestations　症状
congeners　同族体

出典：EPA web site (https://19january2017snapshot.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs_.html#healtheffects) 及び Environmental Health Criteria 140 (https://inchem.org/documents/ehc/ehc/ehc140.htm)から一部抜粋

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【Ｎｏ．２－Ｄ】

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【Ｎｏ．３－Ａ】

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