受験番号＿＿＿＿＿＿＿＿＿＿

令和 3 年 1 月 20 日実施
名古屋市立大学大学院医学研究科博士課程入学試験（2 回目）　　外国人－英語

I. Read the following article and answer the following 5 questions.

この部分に掲載されている文章に就いては、著作権法上
の問題から掲載することができませんので、ご了承願います。

受験番号

Quoted from：Nutrition in pediatrics, 5th edition

Question 1

Regarding the sentence underlined (1), what are the major factors that contribute to reduce under-five child mortality (U5MR)?

Question 2

Regarding the sentence underlined (2), how many under-five deaths per year decreased over the two decades since 1990?

Question 3

Regarding the sentence underlined (3), what is the ideal measure that should succeed the micronutrient supplementation programs?

Question 4

Regarding the sentence underlined (4), why do you think micronutrient supplementation will continue to be a cost-effective?

Question 5

Regarding the sentence underlined (5), what do you think the educational goal for consumers is?

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令和 3 年 1 月 20 日実施
名古屋市立大学大学院医学研究科博士課程入学試験（2 回目）　　外国人－英語

II. Read the following sentences and answer the following 4 questions.

この部分に掲載されている文章に就いては、著作権法上
の問題から掲載することができませんので、ご了承願います。

受験番号

Quoted and adapted from：Nat Med 24(1), 22-23, Jan 2019

Question 1. Regarding the sentence underlined (1), please explain why AI is expected to revolutionize many aspects of society.

Question 2. Regarding the sentence underlined (2), please explain the content of two main advances.

Question 3. Regarding the sentence underlined (3), please list the examples of application of machine learning in health care.

Question 4. Regarding the sentence underlined (4), please explain the content of the study by Hannun et al (< 50 words).

受験番号

令和 3 年 1 月 20 日実施
名古屋市立大学大学院医学研究科博士課程入学試験（2 回目）
医学・生物学一般問題（問題用紙1枚、解答用紙2枚）

Select any two of the following four questions, and write your answers on answer sheets provided. Use one sheet per question (if you need more space for answers, continue them on the reverse side of the sheet). Please make sure that you write the number of question you selected in the answer sheet.

<Question 1>

Answer the following questions 1 to 3 regarding PCR.

Q1: What does PCR stand for?

Q2: Explain the principles of PCR.

Q3: Explain how PCR is useful with an example.

<Question 2>

Answer the following questions 1 and 2 about arteries and veins in the systemic circulation.

Q1: Describe the similarities between them from the viewpoints of (a) physiology, (b) histology, and (c) pharmacology.

Q2: Describe the differences between them from the viewpoints of (a) anatomy, (b) histology, (c) hemodynamics, (d) blood gas partial pressure, and (e) discrimination methods.

<Question 3>

Describe the purpose for which restriction enzymes are used in molecular biology research. Also mention the origin, characteristics, function and biological role of the enzyme.

<Question 4>

Answer the following questions 1 and 2 about the membrane potential.

Q1: Explain the mechanism of resting membrane potential (in human cell), basing on the fact that the ion concentrations are different between intracellular ions and extracellular ions.

Q2: Why does local anesthesia, a sodium channel blocker, block the pain during an operation? Explain this mechanism using a key word of “action potential”.