

令和 4 年 度

試 験 問 題 ②

学 科 試 験

(9時～12時)

【注 意】

1. 試験開始の合図があるまで、この問題冊子の中をみてはならない。
2. 試験教科、試験科目、ページ、解答用紙および選択方法は下表のとおりである。

教 科	科 目	ページ	解答用紙数	選 択 方 法
数 学	数 学	1～10	2 枚	数学、英語は必須解答とする。 理科は左の3科目のうちから1科目を選択せよ。
英 語	英 語	11～14	3 枚	
理 科	化 学	15～26	2 枚	
	生 物	27～44	2 枚	
	物 理	45～52	1 枚	

3. 監督者の指示に従って、選択しない理科科目を含む全解答用紙(10枚)に受験番号と選択科目(理科のみ)を記入せよ。
 - ① すべての受験番号欄に受験番号を記入せよ。
 - ② 理科は選択科目記入欄に選択する1科目を○印で示せ。
上記①、②の記入がないもの、および理科2科目または理科3科目選択した場合は答案全部を無効とする。
4. 解答はすべて解答用紙の対応する場所に記入せよ。
5. 問題冊子の余白を使って、計算等を行ってもよい。
6. 試験開始後、問題冊子の印刷不鮮明、ページの落丁・乱丁および解答用紙の汚れ等に気づいた場合は、手を挙げて監督者に知らせよ。
7. 解答用紙はいずれのページも切り離してはならない。
8. 解答用紙は持ち帰ってはならない、問題冊子は持ち帰ってよい。

英 語

I. Write 70-100 words about what you would do if you had 100,000,000 yen.

(30 点)

This task will be graded on both content and the accuracy of the English language used.

II. 次の英文を読んで、設問に答えよ。(* 印の語には注がある。)(50 点)

Quitting cigarettes triggers the regrowth of healthy cells, undoing some of the damage done by decades of heavy smoking, according to a study. Even the cells in the airways* of a 70-year-old who has smoked 10,000 packets of cigarettes over their lifetime can start to recover, researchers said. (1) 研究によると、たばこの煙による損傷を受けずに気道内壁の中で休止状態にあった細胞が活性化して増殖し、損傷した細胞に取って代わることが発見された。

Previous work showed that former smokers who quit seven years earlier had a 43 per cent lower risk of lung cancer compared with those who still smoked. Former smokers who quit 12 years earlier had a 72 per cent lower risk. The study in *Nature* suggests that people who have given up smoking have more “genetically healthy” lung cells than people who still smoke.

Cancer Research UK said: “The study shows that quitting smoking could do much more than just stopping further damage to the lungs. Researchers believe it could also allow new, healthy cells to actively repair the lining* of the airways. This shift could help protect against cancer.” The cells of the lungs of someone who has never smoked are at normal or near-normal levels of health. For smokers this falls to between 4 and 10 per cent but for someone who has quit, the proportion of healthy cells can return to between 20 and 40 per cent. The researchers, from the Wellcome Trust Sanger Institute in Essex and University College London Hospital, found that the benefits of stopping smoking “begin immediately, accumulate with time and are evident even after quitting late in life”.

They said, however, that the damage caused by smoking to deeper layers of lung

tissue* “is not reversible”. Smoking can damage the DNA in lung cells and create genetic errors. If there are enough mutations*, the cells can divide uncontrollably and become cancerous.

Researchers took lung biopsies* from 16 people including smokers, ex-smokers and people who had never smoked, and sequenced* the DNA from 632 cells. They found that up to 96 per cent of cells in a smoker’s lungs had genetic mutations not present in non-smokers’ lungs and 25 per cent of these cells had at least one mutation linked to cancer.

The researchers said they were surprised by their findings that the lungs of people who had given up smoking had four times more healthy cells in their airways than people who still smoked and that these cells were as healthy as those in people who had never started. The study concludes: “Stopping smoking, at any age, does not just slow the accumulation of further damage, but can awaken cells which were unharmed by past lifestyle choices.” Peter Campbell, of the Sanger Institute, told the BBC: “(2) We were totally unprepared for the finding. There is a population of cells that magically replace the lining of the airways. One of the remarkable things was patients who had quit, even after 40 years of smoking, had regeneration of cells that were totally undamaged by the exposure to tobacco.”

注

airway* 気道

lining* 内壁・内層

tissue* 生体組織

mutation* 突然変異

biopsy* 生検, 生体組織検査 (のための検体)

sequence* 遺伝子配列を決定する, ゲノムを解読する

設問

1. この記事の内容を解答欄内に収まるように、横書きで、日本語で要約せよ。(段落は1つのみとし、各々のアルファベット、数字、句読点を1文字として記入すること)。(10点)
2. 下線部(1) を英訳せよ。(20点)
3. 禁煙による効果が見込めないケースについて日本語で記せ。(10点)
4. 下線部(2) の文はどのようなことを示唆しているか、日本語で記せ。(10点)

III. (1)～(5) の英文を完成するために、それぞれのかっこの中に入れるべき最適の語を選んで、英語で記せ。(10点)

- (1) The main _(a)(logics / volumes / functions / incomes / incentives) of the human brain mean that it is a _(b)(so-called / whereby / equate / prospect / decade) computer.
- (2) Being _(a)(accommodated / supplemented / declined / confined / varied) to our homes during the Covid-19 pandemic has had a huge _(b)(survey / impact / entity / formula / method) on our lives.
- (3) Many people who _(a)(immigrated / converted / exposed / edited / affected) to America are happy with the quality of the _(b)(element / display / infrastructure / reverse / psychology) there.
- (4) The government is making the next _(a)(compile / tradition / initial / phase / inevitable) of the project its number one _(b)(currency / parallel / network / unique / priority) at the moment.
- (5) The _(a)(percent / style / role / sex / ratio) of skilled jobs to unskilled jobs is eight to two, so this fact should be _(b)(survived / acknowledged / layered / assigned / edited) by the government.

(使用語彙はAveril Coxhead の*Academic Word List* (AWL) より.)

IV. Write approximately 120 words using the format given in the answer sheet and according to the following instructions:

Argue for or against completely banning smoking in public indoor spaces in Japan.

(60 点)

This task will be graded on both content and the accuracy of the English language used.

(別紙解答用紙IVの様式にしたがって解答せよ。)