

高知大学

平成 31 年度 入学試験問題(前期日程)

英 語

試験時間 120 分

医学部：医学科

問題冊子 問題…… 1 ~ 5 ページ…… 1 ~ 14

解答用紙…… 4 枚

配 点……表示のとおり

注 意 事 項

1. 試験開始の合図まで、この問題冊子を開かないこと。
2. 試験中に、問題冊子・解答用紙の印刷不鮮明、ページの落丁・乱丁及び下書用紙の不備等に気付いた場合は、手を挙げて監督者に知らせること。
3. 各解答用紙に受験番号を記入すること。
なお、解答用紙には、必要事項以外は記入しないこと。
4. 解答は、必ず解答用紙の指定された箇所に記入すること。
5. 解答用紙の各ページは、切り離さないこと。
6. 配付された解答用紙は、持ち帰らないこと。
7. 試験終了後、問題冊子、下書用紙は持ち帰ること。
8. 試験終了後、指示があるまでは退室しないこと。

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次の英文を読んで、設問に答えなさい。(85点)

Offering hope and encouragement to the many adults who have somehow neglected to exercise for the past few decades, a new study suggests that becoming physically active in middle age, even if someone has been sedentary^(註) for years, substantially reduces the likelihood that he or she will become seriously ill or physically disabled in retirement.

The new study joins a growing body of research examining successful aging, a topic of considerable scientific interest, as the populations of the United States and Europe grow older, and so do many scientists. When the term is used in research, successful aging means more than simply remaining alive, although that, obviously, is the baseline requirement. Successful aging involves minimal debility^(註) past the age of 65 or so, with little or no serious chronic diseases, depression, mental decline or physical infirmities^(註) that would prevent someone from living independently.

Previous studies have found that several unsurprising factors contribute to successful aging. Not smoking is one, as is moderate alcohol consumption. Having money has also been found to make a difference: People with greater economic resources tend to develop fewer health problems later in life than people who are not well off^(註).

But (active, adulthood, being, during, important, is, particularly, physically). In one large-scale^⑧ study, published last fall, that looked at more than 12,000 Australian men aged between 65 and 83, those who engaged in about 30 minutes of exercise five or so times per week were much healthier and more likely to be alive 11 years after the start of the study than those who were sedentary, even when the researchers adjusted for smoking habits, education, body mass index^(註) and other variables.

Whether exercise habits need to have been established and maintained throughout adulthood, however, in order to affect aging has been less clear. In other words, if someone has neglected to exercise during young adulthood and early middle-age, is it too late to start exercising and still have a meaningful impact on health and longevity^(註) in later life?

To address that issue, researchers with the Physical Activity Research Group at University College London and other institutions turned recently to the large volume of data contained in the ongoing English Longitudinal Study of Aging, which has tracked the health habits of tens of thousands of British citizens for decades, checking in with participants multiple times and asking them how they currently eat, exercise, feel and generally live.

For the study, which appeared in the February issue of the British Journal of Sports Medicine, scientists isolated responses from 3,454 healthy, disease-free British men and women aged between 55 and 73 who, upon joining the original study of aging, had provided

clear details about their exercise habits, as well as their health, and who then had repeated that information after an additional eight years.

The researchers classified the chosen respondents according to whether they were physically active or not at the beginning of the study, using the extremely generous definition of one hour per week of moderate or vigorous activity to qualify someone as active. Formal exercise was not required. An hour per week of “gardening, cleaning the car, walking at a moderate pace, or dancing” was enough, said Mark Hamer, a researcher at University College London who led the study.

The scientists then re-grouped the respondents after the eight-year follow-up, marking them as having remained active, become active, remained inactive or become inactive as they moved into and through middle-age. They also quantified^(註) each respondent's health throughout those years, based on diagnosed diabetes, heart disease, dementia^(註) or other serious conditions. And the scientists directly contacted their respondents, asking each to complete objective tests of memory and thinking, and a few to wear an activity monitor for a week to determine whether self-reported levels of physical activity matched actual levels of physical activity. ① (They did.)

In the eight years between the study's start and end, the data showed, those respondents who had been and remained physically active aged most successfully, with the lowest incidence of major chronic diseases, memory loss and physical disability. But those people who became active in middle-age after having been sedentary in prior years, about 9 percent of the total, aged almost as successfully. These late-in-life exercisers had about seven times less risk of becoming ill or infirm after eight years compared with those who became or remained sedentary, even when the researchers took into account smoking, wealth and other factors.

Those results reaffirm^(註) both other science and common sense. A noteworthy 2009 study of more than 2,000 middle-aged men, for instance, found that those who started to exercise after the age of 50 were far less likely to die during the next 35 years than those who were and remained sedentary. “The reduction in mortality^(註) associated with increased physical activity was similar to that associated with quitting smoking,” the researchers concluded.

But in this study, the volunteers did not merely live longer; they lived better than those who were not active, making the message inarguable for those of us in mid-life. “Build activity into your daily life,” Dr. Hamer said.

(Exercise to Age Well, Whatever Your Age, [https://well.blogs.nytimes.com/](https://well.blogs.nytimes.com/2014/01/29/exercise-to-age-well-regardless-of-age/?mcubz=1)

2014/01/29/exercise-to-age-well-regardless-of-age/?mcubz=1 より。

ただし出題にあたり本文の趣旨を変えない範囲で一部改変した。）

- (注) sedentary : 座りがちな, 運動をしない debility : 衰弱
infirmity : 虚弱, 老衰 well off : 裕福な body mass index : 肥満度指数
longevity : 寿命 quantified : 数値化する dementia : 認知症
reaffirm : 再確認する mortality : 死亡率

設問 1. 下線部 ㉔ successful aging に関する下記の英文 1 ~ 5 について, A ~ C の中で該当するものを選び, 記号で答えなさい。

- A. 本文で述べられている内容と一致している。
- B. 本文で述べられている内容と一致していない。
- C. 本文で述べられている内容では判断できない。

1. Aging populations are stimulating scientists' interest in the concept of successful aging.
2. Candidates for successful aging must first of all remain alive past the age of 65 or so.
3. Successful aging involves debility that would prevent someone from living independently.
4. People who age successfully are happier than those who live with physical infirmities.
5. Successful aging implies the absence of chronic disabling diseases or conditions.

設問 2. 次の英文の指示に英語で答えなさい。

List four factors mentioned in the article that are likely to affect a person's likelihood of aging successfully.

設問 3. 下線部 ㉕ が適切な意味になるように, 英単語を並べ替えなさい。

設問 4. 下線部 ㉖ の答えになるように, 次の文章の (1) ~ (6) に入る適切な英単語を一つ書きなさい。

(1), it is not too (2): a person who becomes physically active in middle age, even if he or she has been sedentary for years, is much less (3) to become seriously ill or physically (4) in retirement (5) someone who remains (6).

設問 5. 本文中の British Journal of Sports Medicine 2 月号に発表された研究に関して、次の英文 1～10 について、A～C の中で該当するものを選び、記号で答えなさい。

- A. 本文で述べられている内容と一致している。
- B. 本文で述べられている内容と一致していない。
- C. 本文で述べられている内容では判断できない。

1. The study was based on data from the ongoing English Longitudinal Study of Aging.
2. The participants in the study were asked to exercise moderately for one hour a week.
3. The researchers monitored the participants' physical and mental health for eight years.
4. Some of the participants were suffering from serious medical conditions before the study.
5. Some of the participants developed diabetes, heart disease or dementia during the study.
6. Some of the participants were already physically active at the beginning of the study.
7. The majority of the participants remained physically active throughout the study.
8. Almost a tenth of the participants became physically active during the study.
9. Those who became physically active during the study aged the most successfully.
10. The younger a participant was, the more likely he or she was to age successfully.

設問 6. 下線部 ① (They did) の意味と一致するものを A～E から幾つでも選び、記号で答えなさい。

- A. All the respondents were asked to complete tests of memory and thinking.
- B. The researchers checked some of the respondents' level of physical activity.
- C. The researchers asked some of the respondents to wear an activity monitor.
- D. Some of the respondents agreed to wear an activity monitor for a week.
- E. The respondents' self-reported levels of physical activity were accurate.

設問 7. 次の英文の指示に日本語で答えなさい。

Give an example from the text of previous research that reached a similar conclusion to that of the University College London study.

2 次の英文を読んで設問に答えなさい。(55点)

Coffee drinkers, rejoice^(注)! Drinkers of matcha, kombucha and other “wellness-related” coffee alternatives, take a back seat. About 2.25 billion cups of coffee are drunk worldwide each year, and if a new study showing that people who drink three cups of coffee a day live longer than non-coffee drinkers is to be believed, this number may be increasing.

Previous studies looking at links between coffee and health have consistently contradicted each other. In this one, conducted by Imperial College London and in no way sponsored by the coffee industry, researchers investigated the health records of 521,330 people from across Europe. Sixteen years later, 42,000 of them had died from a range of illnesses.

The researchers found that the group with the highest consumption of coffee, those who drank about three cups a day, had a lower risk of liver function and immune response impairment than those who drank one or two cups a day.

While this study alone is unlikely to change many of the minds already vehemently^(注) against coffee, the news is a relief in the current climate of fear of everything, from sugar to gluten.

In reaching their conclusion, the researchers checked for other factors such as smoking. The incidental result was a finding that those who drink more coffee also tend to smoke more. It was only when the effects of smoking were excluded that the health benefits started their upwards climb.

When unequivocally^(注) bad habits are removed from consideration, it becomes clear that those who drink as much coffee as they want are healthier than those who worry about it. The Danes drink the most coffee of all the surveyed European countries—even more than the Italians—and Denmark ranks as one of the happiest countries in the world. So, fill the coffee pot, but throw out the cigarettes.

(*Caffeine Hits Back*, <https://www.thetimes.co.uk/article/caffeine-hits-back-mpcddqml> より。

ただし出題にあたり本文の趣旨を変えない範囲で一部改変した。)

(注) rejoice : 喜ぶ vehemently : 熱烈に unequivocally : 明快に

設問 1. a) 下線部 ㉠ 2.25 billion を数字で書きなさい。

b) 上記 a) で書いた数字の読み方を英語で書きなさい。

設問 2. ㉢【 】の中が適切な意味になるように、下線部①～⑦を並べ替えて数字で答えなさい。

設問 3. 下線部 ㉣ their conclusion の趣旨を英語で述べなさい。

設問 4. 下記の英文 1～10 について、A～C の中で該当するものを選び、記号で答えなさい。

- A. 本文で述べられている内容と一致している。
- B. 本文で述べられている内容と一致していない。
- C. 本文で述べられている内容では判断できない。

1. Some people prefer to drink matcha or kombucha rather than coffee because they believe those drinks are better for their health.
2. Drinking coffee is actually healthier than drinking the same amount of matcha or kombucha.
3. Previous studies have failed to provide decisive evidence concerning the health effects of coffee consumption.
4. Imperial College London refused several offers from the coffee industry to sponsor the reported study.
5. People who drink fewer than three cups of coffee a day have the same risk for all causes of death as non-coffee drinkers do.
6. Many people who are convinced that coffee is unhealthy are expected to change their opinion as a result of this study.
7. The health benefits of coffee consumption were diminished by the effects of smoking.
8. More studies are needed in order to determine whether or not smoking has a negative effect on health.
9. The study clearly showed that people who drink a lot of coffee are healthier than those who worry a lot.
10. Denmark's ranking as one of the happiest countries in the world is related to the fact that Danes drink a lot of coffee.

設問 5. 下線部 ㉤ fill the coffee pot, but throw out the cigarettes の趣旨を英語で述べなさい。

3 次の英文を読んで、設問に答えなさい。(60点)

Kyodo News, 1 August 2018

Parasols, traditionally used only by women, were given out to men Wednesday in a Japanese prefecture where the nation's highest-ever temperature was recorded last month. The parasols were a gift from a Tokyo umbrella maker at a time when many areas have been dealing with dangerous heatwaves.

Saitama Prefecture near Tokyo, whose city of Kumagaya experienced a record 41.1°C on July 23, has been promoting the use of parasols among men to beat heatstroke and heat exhaustion.

"It makes a real difference," said Saitama Governor Kiyoshi Ueda when he held up in the sun one of the 70 foldable parasols given to the prefecture.

Yasuo Wakabayashi, the president of the umbrella maker, Aurora Co., said sales of parasols for men have doubled from last year.

The gift of parasols came amid recent searing temperatures around the country. In the week starting July 16, there were 65 heat-related deaths and over 22,000 people taken to hospitals.

The prefecture said the parasols will be used by male municipal officials in eight Saitama cities and that it will analyze how effective they are in protecting against the sun. The outcome of the analysis will be released on the prefecture's website.

Last year, the prefecture saw some 2,800 people, including 1,000 adults, taken to hospital for heat-related illnesses. About 70 percent of the adults were men.

In the face of the heavy toll on men, some 20 male Saitama prefectural government officials formed a group of "higasa danshi" (parasol men) and started using parasols during their commutes and for other activities to counter the common perception that parasols are only for women.

Membership has since grown to 100, and the group opened an official Twitter account this July to share information online.

(*Japan prefecture with record temperature given parasols for men*, <https://english.kyodonews.net/news/2018/08/5e1c975ef1a1-japan-prefecture-with-record-temperature-given-parasols-for-men.html?phrase=Switzerland&words=>より。

ただし出題にあたり本文の趣旨を変えない範囲で一部改変した。)

(注) heatwave : 酷暑 heatstroke : 熱射病 amid : の真っ最中に
municipal : 市の in the face of : に直面して counter : 対抗する

設問 次の英文の要旨が本文と同じになるように、(1)～(15)に入る適切なものを本文中の下線部 ㉠～㉡から選んで、記号で答えなさい。

In the face of the fact that men accounted for over two thirds of the adults who were (1) in the (2) of Saitama last year, a group of (3) started (4) in order to (5).

This summer, (6), membership of the so-called (7) has grown to 100, and in July they (8), where they have (9) to combat (10).

The group's efforts to challenge the popular notion (11) were recently rewarded with a gift of (12), donated to the prefecture by (13) after (14) in Saitama's city of Kumagaya in late July. The prefecture intends to use this opportunity to analyze the effectiveness of the parasols, which (15).

4 次の英文を読んで設問に答えなさい。(50点)

Mobile or cellular phones are now an integral part of modern telecommunications. In many countries, over half the population use mobile phones and the market is growing rapidly. In 2014, there is an estimated 6.9 billion subscriptions globally. In some parts of the world, mobile phones are the most reliable or the only phones available.

Given the large number of mobile phone users, it is important to investigate, understand and (1) any potential public health impact.

Mobile phones (2) by transmitting radio waves through a network of fixed antennas called base stations. Radiofrequency^(註) waves are electromagnetic fields, and unlike ionizing^(註) radiation such as X-rays or gamma rays, can neither break chemical bonds nor cause ionization in the human body.

Exposure levels

Mobile phones are low-powered radiofrequency transmitters, operating at frequencies between 450 and 2700 MHz with peak powers in the (3) of 0.1 to 2 watts. The handset only transmits power when it is turned on. The power (and hence the radiofrequency exposure to a user) falls off rapidly with increasing (4) from the handset. A person using a mobile phone 30–40 cm (5) from their body—for example when text messaging, accessing the Internet, or using a “hands-free” device—will therefore have a much lower exposure to radiofrequency fields than someone holding the handset against their head.

In addition to using “hands-free” devices, which (6) mobile phones away from the head and body during phone calls, exposure is also reduced by limiting the number and (7) of calls. Using the phone in areas of power reception also decreases exposure as it allows the phone to transmit at reduced (8). The use of commercial devices for reducing radiofrequency field exposure has not been shown to be effective.

Mobile phones are often (9) in hospitals and on airplanes, as the radiofrequency signals may (10) with certain electro-medical devices and navigation systems.

Are there any health effects?

A large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse^(註) health effects have been established as being caused by mobile phone use.

Short-term effects

Tissue heating is the principal mechanism of interaction between radiofrequency energy and the human body. At the frequencies used by mobile phones, most of the energy is absorbed by the skin and other superficial tissues, resulting in negligible^(注) temperature rise in the brain or any other organs of the body.

A number of studies have investigated the effects of radiofrequency fields on brain electrical activity, cognitive function, sleep, heart rate and blood pressure in volunteers. To date, research does not suggest any consistent evidence of adverse health effects from exposure to radiofrequency fields at levels below those that cause tissue heating. Further, research has not been able to provide support for a causal relationship between exposure to electromagnetic fields and self-reported symptoms, or “electromagnetic hypersensitivity^(注)”.

Long-term effects

Epidemiological^(注) research examining potential long-term risks from radiofrequency exposure has mostly looked for an association between brain tumours^(注) and mobile phone use. However, because many cancers^(注) are not detectable until many years after the interactions that led to the tumour, and since mobile phones were not widely used until the early 1990s, epidemiological studies at present can only assess those cancers that become evident within shorter time periods. However, results of animal studies consistently show no increased cancer risk for longterm exposure to radiofrequency fields.

(Electromagnetic fields and public health: mobile phones. World Health Organization Fact Sheets No. 193, Reviewed October 2014 より。)

(注) radiofrequency : 無線周波数, 高周波数 ionizing : 電離する
adverse : 有害な negligible : 無視できる hypersensitivity : 過敏
epidemiological : 疫学の tumour : 腫瘍 cancer : がん(癌)

設問 1. 本文中の(1)～(10)に当てはまる単語を選び, 記号で答えなさい。

- A. prohibited B. range C. monitor D. power
E. length F. communicate G. away H. interfere
I. distance J. keep

設問 2. 下記の 1～10 の内容について, A～C の中で該当するものを選び, 記号で答えなさい。

- A. 本文で述べられている内容と一致している。
B. 本文で述べられている内容と一致していない。
C. 本文で述べられている内容では判断できない。

1. 高周波エネルギーの人体への影響として組織温度の上昇がある。
2. 高周波エネルギーは化学結合を切断する。
3. 携帯電話による健康被害がこれまでの多くの研究によって確認されている。
4. 強い高周波エネルギーは血圧を上昇させる。
5. 高周波の影響を減らすとされている商品の効果は不確かである。
6. 携帯電話による高周波エネルギーの多くは人体の深部まで到達する。
7. 動物実験では長期間の高周波への暴露による発がん性は証明されていない。
8. 携帯電話は常に電波を送信している。
9. 人体では長期間の高周波への暴露によって脳腫瘍発症が増える可能性がある。
10. 世界には電話として使えるのが携帯電話しかない地域がある。

5

次の英文を読んで設問に答えなさい。(50点)

Cities promise to bring people closer to the things they need to live their lives, delivering access and mobility to jobs, food, health-care providers—everything people need, including other people. Mobility and access represent two of the pathways by which cities can deliver the urban ④ advantage for health and prosperity for urban residents. Transportation in the world's cities is increasingly moving towards private motorized transportation^(註). This trend may grant increased mobility and access to many individuals who need it, but it also brings the potential for substantial ⑤ hazards to health. Increasing use of motorized transport and urban sprawl are commonly associated with more sedentary^(註) behaviour, which is closely associated with the rise of NCDs^(註) in cities.

The use of personal motor vehicles in cities contributes significantly to urban air pollution. Monitoring the air quality in 1600 cities in 91 countries in 2014, WHO found that only 12% of the monitored populations were living in cities compliant with^(註) air quality guidelines. ⑥ City life exposes residents to relatively higher air pollution levels close to the source of the pollution. Recent estimates have indicated that as many as 3.3 million people die prematurely every year from exposure to fine particulate matter^(註), the type of air pollution that is most strongly associated with motor vehicle exhaust^(註) and other forms of combustion^(註). These numbers are on the rise, as deaths attributable to air pollution to which motor vehicles are an important contributor, grew by 11%.

One of the most tragic consequences of the motorization of urban transport has been the rise of road traffic crashes. Over the last 20 years, the number of deaths attributable to road traffic crashes has increased by 46%, becoming the eighth leading cause of death in the world. Without intervention, WHO expects the global burden to exceed 1.9 million deaths and become the seventh leading global cause of death by 2030.

⑦ Everyone deserves the right to safe, convenient passage to the places they need to go for their daily needs. It is the role of the city to enable its citizens to do so efficiently and safely. This will depend on cities reducing the number of vehicles on the road and the distances they travel by facilitating mass and active transport alternatives, while ensuring that they are both desirable and practical for users. When people can access what they need on foot or bicycle, or quickly and conveniently by public transportation, operating a motor vehicle becomes a less desirable choice. Planning for transit-oriented development, with

multi-use spaces and residences clustered around public transportation options and walkable spaces is ideal. Whether cities are currently planning new development, or they are locked in to current urban forms, there are cost-effective, proven approaches that reduce car dependence, free up city streets and create an enabling environment for healthier living.

(Global Report on Urban Health : equitable, healthier cities for sustainable development,

World Health Organization (WHO) 2016 より。

ただし出題にあたり本文の趣旨を変えない範囲で一部改変した。)

- (注) motorized transportation : 自動車 sedentary : 座りがちな, 運動をしない
NCDs : Non-Communicable Diseases 非感染性疾患(感染症ではなく, 癌, 心臓病, 糖尿病など生活習慣が関与する病気)
compliant with : 準拠する fine particulate matter : 微小粒子物質
exhaust : 排気ガス combustion : 燃焼

設問 1. 下記の 1～5 の内容について、A～C の中で該当するものを選び、記号で答えなさい。

- A. 本文で述べられている内容と一致している。
- B. 本文で述べられている内容と一致していない。
- C. 本文で述べられている内容では判断できない。

1. 世界の都市における移動手段としては公共交通機関の利用が増えている。
2. 2014 年の WHO の大気汚染調査では、ほとんどの都市で大気はよい状態であった。
3. 過去 20 年間で、交通事故による死亡は約 1.5 倍になっている。
4. 現在、交通事故による死亡は、世界で第 7 位の死亡原因である。
5. 大気汚染によって増えたのは主に癌による死亡である。

設問 2. 下線部 ㉑ と ㉒ について、それぞれの内容を具体的に日本語で書きなさい。

設問 3. 下線部 ㉓ を日本語に訳しなさい。

設問 4. 下線部 ㉔ では、市民のために行政によるどのような都市作りが望まれると述べているか、日本語 200 字以内で説明しなさい。