2025 年度
理工学研究科 環境共生工学専攻
博士前期課程
一般選抜（第Ⅰ期）試験問題

英　　語

開始時刻　午前 10 時 30 分
終了時刻　午前 11 時 30 分

【注意事項】

１．　答案用紙には受験番号、氏名を必ず記入してください。
２．　問題番号が明記された答案用紙を使用して解答してください。
３．　配布された答案用紙は試験が終了したら、必ず提出してください。
　　（問題用紙は提出しなくてよい）

問１：次の文章を読んで、以下の問に答えなさい。

【How science is changing the game in sports.】

(A)It's an open secret that the countries that win the most medals in the Olympics and Paralympics combine talent and technology. Australia's athletes are preparing for the next three Olympics and Paralympics in Paris in 2024, Los Angeles in 2028, and Brisbane in 2032. Meanwhile, our sports scientists are developing new technologies to help improve sports performance across a range of fields.

Emerging digital technologies like artificial intelligence (AI) and quantum sensing are now in play, as athletes look for a new kind of competitive advantage. Athletes, teams, and coaches across the world are exploring how AI-assisted tools can 'up their game', improve performance and reduce injuries.

Each athlete has unique biochemistry, psychology, and physiology. They respond to working out, nutrition, and competition differently. (B)Eagle-eyed sports fans may have noticed footballers from multiple codes wearing vests under jerseys, or devices stitched in jerseys between their shoulder blades. These biometric trackers can provide information for coaches to monitor individual performance. This data can be combined with AI to improve performance, prevent long- and short-term injury, and optimise training. Quantum sensors can profile the biochemistry of athletes in new ways. It can also be used in drug testing, providing faster and more accurate testing than the current methods.

(C)Wearable devices, most notably smart watches, are helping people track their exercise to understand their progress over time better and encourage them to work out. AI can help personalise workouts to a person's fitness levels and goals. AI-powered pose estimation tools can act as a personal yoga instructor, helping correct poses or techniques.

[D], (E)some ethical concerns remain. Is too much information skewing athletes' intuitive skills or undermining their confidence? It highlighted growing concern about sensitive health data being collected from athletes through digital and other technologies. Since then, the Australian Sports Commission and Australian Institute of Sport have been proactive in developing position statements and safeguards for certain technologies in sports training programs. This is about the use of athlete data in terms of privacy, safety and cybersecurity, and ensuring that data is not used for any purpose without consent.

As we continue embarking on a world of technology in sports science, it is important to grow the next generation of graduates skilled and enabled in the AI, emerging technologies and quantum space. We are still highly active in sports science fields.
(Modified from News and Articles in AUSTRALIA'S NATIONAL SCIENCE AGENCY)

【用語】quantum sensing: 量子センシング、up their game: ゲームを盛り上げる、jerseys: ジャージ、stitched: 縫いこまれた、skewing: ゆがむ、intuitive skills: 直感力、consent: 同意、embarking: 着手する

（１）下線部(A)を日本語に訳しなさい。

（２）下線部(B)で作者が意図する内容として最も適したものを、次の中から１つ選びなさい。

i. 鷹好きなスポーツファン　　ii. 鷹の眼をした鳥人間

iii. 鷹の様に高速回転する扇風機　　iv. 鷹の様に目が効くサッカーサポーター

（３）下線部(C)を日本語に訳しなさい。

（４）文章中の[　　D　　]に入る最も適切な語句を、次の中から１つ選びなさい。

i. Therefore　　ii. However　　iii. Also　　iv. Consequently

（５）下線部(E)の対応策として何が行われたか、日本語で答えなさい。

問２：次の文章を読んで、以下の問に答えなさい。

【Dinosaur-killing Chicxulub asteroid formed in Solar System's outer reaches.】

(A)The object that smashed into Earth and kick-started the extinction that wiped out almost all dinosaurs 66 million years ago was an asteroid that originally formed beyond the orbit of Jupiter, according to geochemical evidence from the impact site in Chicxulub, Mexico.

The findings, published on 15 August in Science, suggest that the mass extinction was the result of a train of events that began during the birth of the Solar System. Scientists had long suspected that the Chicxulub impactor, as it is known, was an asteroid from the outer Solar System, and these observations bolster the case.

The Cretaceous/Palaeogene (K/Pg) extinction was the fifth in a series of mass extinctions that have occurred during the past 540 million years or so: the period in which animals have spread around Earth. (B)この出来事により、すべての恐竜を含む60%以上の種が絶滅した。

Since 1980, evidence has accumulated that the extinction was caused by a city-sized object hitting Earth. Such an impact would have thrown huge volumes of sulfur, dust and soot into the air, partially blocking out the Sun and causing temperatures to plummet. A layer of iridium metal, which is rare on Earth but more common in asteroids, was deposited all over the planet around the time the extinction began. And in the 1990s, scientists described the impact site, a huge buried crater near Chicxulub on Mexico's Yucatán Peninsula.

"We wanted to identify the origin of this impactor," says Mario Fischer-Gödde, an isotope geochemist at the University of Cologne in Germany. (C)To find out what the object was and where it came from, he and his colleagues obtained samples of K/Pg rocks from three sites, and compared them with rocks from eight other impact sites from the past 3.5 billion years.

【用語】the mass extinction: 大量絶滅、asteroid: 小惑星、geochemical: 地質化学的な、Chicxulub: チクシュルーブ、Cretaceous/Palaeogene (K/Pg): 白亜紀/古第三紀、plummet: 急落する

（１）下線部(A)を日本語に訳しなさい。

（２）地球に衝突した小惑星に関する以下の点について本文中に書かれていることを日本語で答えなさい。

i. どこから来たのか

ii. どのくらいの大きさか

iii. どのような物質を含んでいるか

（３）下線部(B)を以下に示した英単語もしくは英連語を並べ替えて、英文にしなさい。ただし、文頭の単語であっても最初の文字は小文字で表記している。

than, the event, of, 60%, all dinosaurs, species, wiped out, including, more

（４）下線部(C)を日本語に訳しなさい。