

② 入試区分

工学研究科博士後期（Ⅱ期）

③ 出題科目

英語

④ 出題の意図

科学・工学・産業技術に関する英語の語彙力・読解力・要約力・作文力を多面的に評価する。以下の各設問では、専門的内容を理解し、適切に英語で表現・運用する力を確認する。 [Ⅰ]

高度な専門内容について英語で論理的に説明する能力、および研究の社会的意義を明確に表現する能力を評価する。

[Ⅱ] 学術論文に必要な基本語彙の理解度を評価する。

[Ⅲ] 数式や記号を英語で正確に表現する能力を評価する。

[Ⅳ] 研究活動における実務的英語運用能力（依頼・礼儀・構成）を評価する。

[Ⅴ] 英文読解力、要約力に加え、与えられた内容を踏まえて本質的な社会的影響を論理的に考察し、英語で表現する高度な思考力・記述力を評価する。

【英語】

[Ⅰ] 次の①～④の問いに, それぞれ 5～10 文の英語で答えよ.

- ① これまでに行ってきた研究課題について概要と社会的な意義を説明せよ.
- ② これまでに行った実験の 1 つを選び、実験の目的、目的解決のために行った実験方法と得られた結果について説明せよ
- ③ 後期課程で取り組みたい研究について、研究の概要、目的、社会的な意義を説明せよ.
(①を発展させた研究の場合は、違いが明確に分かるように書くこと)
- ④ 博士前期課程修了後に取り組みたいと考えていることについて説明せよ.

[Ⅱ] 次の(1)～(10)に示す日本語と最も意味が近い英語(a)～(o)から選び
記号で答えよ. ただし, ここではすべて単数形で記述している.

- (1) 考察 (2) 著者 (3) 要旨 (4) 方法 (5) 材料
(6) 結果 (7) 解析 (8) 要約 (9) 結論 (10) 所属機関

- (a) Result (b) Material (c) Affiliation (d) Title (e) Method
(f) Acknowledgement (g) Author (h) Summary (i) Discussion (j) Methodology
(k) Conclusion (l) Introduction (m) Reference (n) Abstract (o) Analysis

[Ⅲ] 次に示す(1)～(5)の数学的表記(数式または数字)を英語で表記せよ.

- (1) 42.195 (2) $\frac{a}{b}$ (3) -5
(4) $x^2 - y^2 = r^2$ (5) $\sqrt[3]{8} = 2$

[IV] You are going to write an email to Dr. John Smith. Write the email in English, following instructions ①-⑤.

- ① Address the email to Dr. John Smith.
- ② Introduce yourself as a PhD student.
- ③ Ask for permission to use a figure published on Dr. Smith's website in your paper.
- ④ Use an appropriate subject line and closing.
- ⑤ At the end of the email, write your name, affiliation, and full university address in English. (※大学の所在地 日本国 香川県高松市浜ノ町 8-53)

[V] ①～⑥の英文はドローンについて書かれています。以下の問いに答えよ。

- (1) ①～⑥の内容を日本語で要約せよ。
- (2) ①～⑥を踏まえて、ドローン技術は将来人間社会にどのような本質的変化をもたらすと考えられるか。その社会的意味について、あなたの見解を 10～15 文の英語で論じよ。

① Many young people look forward to getting their driver's license. Some people even train to get a license to captain a boat or pilot an airplane. People who operate these machines must have special skills to maneuver them safely. However, there may come a day when drivers, captains, and pilots will be replaced by remote, computerized devices. Such devices are called "drones."

② The idea of a drone began with Nikola Tesla. In 1898, Tesla amazed his audience in New York by moving a small boat using only radio waves and a remote controller. He believed that remote-controlled vehicles would be useful in many ways in the future.

③ Since Tesla's experiment, governments have used drones for military purposes. Since 2006, drones have also been used for non-military purposes. They are used to deliver supplies to remote areas, help fight wildfires, and inspect pipelines for leaks.

④ Recently, the use of drones has increased even more. Delivery companies are beginning to use drones to deliver packages. Some companies are considering using unmanned ships to transport cargo. This technology may greatly change transportation systems in the near future.

⑤ As the number of flying drones increases, concerns about their misuse have also grown. Some drones have been used to invade personal privacy or even for criminal activities such as terrorism and sexual offenses. There have also been cases of drones falling and causing accidents. These incidents raise serious safety and ethical issues. As a result, many countries are introducing stricter legal regulations to control drone operations. Proper laws and monitoring systems are necessary to ensure public safety.

⑥ At the same time, the applications of drone technology continue to expand. Drones are increasingly used in small or dangerous areas where humans cannot easily enter. For example, they can operate at high altitudes, in polluted environments, under the sea, and even in outer space. Some researchers are also developing swarm drones inspired by insects and birds. These drones can cooperate with each other and perform complex tasks efficiently. Such developments may greatly broaden the role of drones in science, industry, and exploration.

【英語】

[Ⅰ] ①～④の指示にしたがって英文を作成する

[Ⅱ] (1) i (2) g (3) n (4) e (5) b
(6) a (7) o (8) h (9) k (10) c

[Ⅲ] (1) Forty-two point one nine five

(2) a divided by b (a over b)

(3) Minus five

(4) x squared minus y squared equals r squared

(5) The cube root of eight is two (Cube root of eight equals two)

[Ⅳ] ①～⑤を踏まえて英文メールを作成する.

[Ⅴ] (1)

- ① 人が操縦している乗り物は将来、遠隔操作やコンピュータ制御によるドローンに置き換えられる可能性がある。
- ② ドローンの概念はテスラの無線遠隔操作の実験に始まり、将来の多様な利用が予見されていた。
- ③ ドローンは軍事用途に加え、物資輸送や災害対応などの非軍事分野でも活用されている。
- ④ 近年ドローンの利用は拡大し、配送や輸送分野での活用により交通システムの変化が期待されている。
- ⑤ ドローンの普及に伴い、プライバシー侵害や犯罪、事故などの問題が生じ、規制や監視体制の必要性が高まっている。

⑥ ドローンは危険環境や宇宙などでも利用が広がり、群制御技術の発展により科学や産業分野での役割が拡大している。

(2) Drone technology is expected to bring fundamental changes to human society. First, it will transform transportation and logistics systems by enabling automated and efficient delivery. This will reduce human labor and improve accessibility to remote areas. Second, drones will expand human capabilities by operating in dangerous environments such as disaster sites and outer space. However, there are serious concerns about safety, privacy, and security. Misuse of drones can lead to accidents or criminal activities. Therefore, appropriate regulations and monitoring systems are essential.

In addition, the development of swarm drones may lead to new forms of collective intelligence. These systems can perform complex tasks more efficiently than individual machines. As a result, drone technology may redefine the relationship between humans and machines. Humans may shift from direct operators to supervisors of autonomous systems. This transition could significantly change employment structures and social systems. Therefore, it is important to balance technological advancement with ethical considerations.