27

1
2
3 3 1
2 I II A B 2
III 3
4 2

5

0
6
7

8
9 120
10

I 60

    1 a, b x 2 $x(x^2 + ax + b) = 0$

   $x = 0$ a b

     (a, b)

    2 $20 \cdot 15^{-x} + 225^x - 21 = 0$

II   60

    1

$$\begin{cases} \sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta \\ \cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta \end{cases}$$

$$\sin 3x = 3\sin x - 4\sin^3 x$$

    2 $y = \sin 3x + 3\cos 2x + 6\sin x \ (0 \leqq x < 2\pi)$

          x

III   O $y = x^2$ 2   A(a, a^2), B(b, b^2)

 ∠AOB   A   B ℓ

                  60

    1 a b

    2 ℓ $y = px + q$ q

    3   O ℓ OH   H

I $\{a_n\}, \{b_n\}$

$$a_1 = 10, \ b_1 = 24, \ a_{n+1} = 2a_n - 8, \ b_{n+1} = \frac{1}{2}b_n + 6 \ \ (n = 1, 2, 3, \cdots)$$

60

1 $\{a_n\}, \{b_n\}$

2 3 $a_2, b_2, 6$

3 3 $a_n, b_n, 6$ n

II $f(x) = |x^2 - 1|$ $F(a) = \displaystyle\int_a^{a+1} f(x) \, dx$ $a > 0$

60

1 $y = f(x)$

2 $F(a)$

3 $F(a)$ a

I   **II**   **A**   **B**

I 　　$y = x^2 e^{-x}$ 　　　　　　　　C 　　　　　　　　　　　　60

    1　　C 　　　　　　　x　　2

    2　　C 　　　$y = \dfrac{1}{e}x$

    3　　C 　　　$y = \dfrac{1}{e}x$

II 　$n = 1, 2, 3, \cdots$ 　　　　　　x 　　　　　$f_n(x)$

$$f_n(x) = \sum_{k=1}^{n} \frac{(-1)^{k-1}}{k} x^k = x + \cdots + \frac{(-1)^{n-1}}{n} x^n$$

$$0 \leqq x < 1 \qquad\qquad\qquad 60$$

    1　$\left| f_{n+1}\left(\dfrac{1}{2}\right) - f_n\left(\dfrac{1}{2}\right) \right| \leqq \dfrac{1}{1000(n+1)}$ 　　　　　n

    2　$\displaystyle\lim_{n \to \infty} f_n'(x)$

    3　n 　　　　　　　　　　$f_n(x) \leqq \log(x + 1)$

III

2015 Entrance Exam

平成27年度　入学者選抜学力試験(前期)

English

英　語

Part 1 Reading Comprehension

Answer questions (1) – (8) based on the following article. （配点80点）

Privacy vs Convenience

We all value our privacy. The thought of strangers entering our home, following our every step, and observing what we do twenty-four hours a day would fill most of us with disgust. Such a society would remind us of George Orwell's novel Nineteen Eighty-Four in which ①Winston Smith is under the constant gaze of Big Brother. Surely, in a democratic society, because people value their privacy so much, they would not tolerate or facilitate invasions of their privacy by a repressive state or individual such as Big Brother. However, our daily interaction with the Internet suggests that people value convenience even more than privacy.

To access many services on the Internet we need to use a password that we have created. If we were really concerned about our privacy we would think of passwords that no one else (or no machine) could easily guess. So the fact that in 2012 the most popular password was 'password' and the second most used was '123456' [1] indicates that many people prefer an easy-to-remember password to one that is complicated and safer, but hard to remember. This is even true for more technically minded people. A leak of 100,000 users' IEEE* website data revealed that the most common passwords were '123456' and 'ieee2012' [1]. Many companies offer a feature called ②'two-factor authentication' to make logging into their online services more secure. However, according to the results of a 2013 survey as many as 79% of Internet users had no knowledge of two-factor authentication [2].

Many people now use online services known as Social Network Services or SNS. These SNS are a wonderful and convenient way to keep in touch with family, friends and contacts. However, it seems that people's desire to share the details of their lives with friends is more important than the risk that this data may get into the wrong hands. Photographs of a wild teenage party may seem harmless now, but in the hands of a future employer they could have negative consequences.

Even for people who take precautions to protect their privacy, accessing the Internet can leave a digital trail that reveals their interests, health issues, politics, plans, and friends. A recent article by the online technology website called Ars Technica demonstrated that we unknowingly reveal a lot of information about ourselves when connecting to the Internet [3]. Steve Henn, the technology correspondent for National Public Radio (NPR), agreed to have his Internet activities monitored for one week by Ars Technica. Although he took precautions not to reveal private information, there was considerable leakage from his Internet-connected devices which allowed the monitors to piece together a detailed picture of the reporter's private life. At the end of the week, Mr.

Henn realized that anyone tracking his Internet usage "could actually know more about my own past than I did" [3].

In the futuristic movie Minority Report made in 2002, as Tom Cruise's character John Anderton walks through the streets he is greeted by automatic advertisements that recognise him. The existence of 'cookies', the small bits of code left by websites on your hard disk, makes it possible for you to experience the Internet in much the same way that John Anderton experiences life in 2054. Cookies keep a record of sites you have visited and searches you have made. These cookies are an important component of your digital trail. This trail allows websites that communicate with these cookies to tailor advertisements to your own interests. However, according to a recent newspaper report, more and more people are turning these cookies off [4]. Perhaps people are becoming more aware that protecting one's privacy might be more important than convenience.

* IEEE stands for 'Institute of Electrical and Electronics Engineers'. The IEEE is the world's largest professional association dedicated to advancing technological innovation.

References

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http://arstechnica.com/information-technology/2012/11/born-to-be-breached-the-worst-passwords-are-still-the-most-common/. [Accessed: July 3, 2014].

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[4] J. Barnes (2013, May 24). "*Internet users' privacy concerns may mean cookies start to crumble.*" The Guardian Newspaper [Online]. Available:
http://www.theguardian.com/technology/blog/2013/may/24/internet-privacy-cookies-firefox. [Accessed: July 3, 2014].

(1) 下線部①の Winston Smith はどのような人か. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）a character in a book
（イ）the title of a novel
（ウ）the author of Big Brother
（エ）someone who watches Big Brother

(2) 本文の著者は people と privacy について, どのように考えているか. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）People think that online privacy is more important than offline privacy.
（イ）In democracies, people should value convenience more than privacy.
（ウ）Even in democracies, people value privacy more than convenience.
（エ）The way we use the Internet shows that we don't value privacy that much.

(3) 下線部②の 'two-factor authentication' とは何を指すか. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）a complicated and difficult-to-remember password that online service companies want their customers to use
（イ）a method of making access to websites more secure
（ウ）an easy way to access online services that companies are trying to sell
（エ）an online service that only 21% of Internet users use

(4) 本文の著者は SNS にはどのような問題があると述べているか. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）People can waste their time using SNS.
（イ）SNS encourage unruly parties.
（ウ）People may share data that they will regret later in life.
（エ）SNS make employers concerned about users' privacy.

(5) 第4段落で述べられている Ars Technica の記事が示したこととは何か. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）It showed that people know how to protect their private data when accessing the Internet.
（イ）It showed that people unintentionally disclose information about themselves when accessing the Internet.
（ウ）It showed that Steve Henn leaked some sensitive information from the NPR website.
（エ）It showed that the technology correspondent for NPR had monitored the Internet activities of Ars Technica reporters.

(6) 本文の Steve Henn について述べている内容と**一致しないもの**はどれか. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）He is a journalist.
（イ）He works for National Public Radio.
（ウ）His job is to monitor people's Internet activities.
（エ）He makes an effort to protect his online privacy.
（オ）He let Ars Technica track his Internet activities for one week.

(7) 映画 Minority Report はいつのことを描いているか. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）the past
（イ）2002
（ウ）the present
（エ）2054

(8) 本文によると 'cookies' の利便性は何か. 以下の選択肢の中から最も適切なものを一つ選び, 記号で答えよ.

（ア）Cookies make it possible to see advertisements for products that interest you.
（イ）Cookies allow companies to track everything that you do with your devices.
（ウ）Cookies prevent companies from writing code to your hard disk.
（エ）Cookies make it possible for Tom Cruise to be personally greeted by street advertisements.

Part 2　Questions about a Japanese Text

Answer questions (1) – (3) based on the following article. （配点 40 点）

著作権保護のため問題文は省略してあります

(1) Based on the article, mark each of the following statements as True (○) or False (×).

(ア) Having served as the president of a chess club does not demonstrate emergent leadership.
(イ) When applying to Google, having good grades at college is considered a disadvantage.
(ウ) Fourteen per cent of Google employees have not received any college education.
(エ) Having good programming skills is important for technical positions at Google.
(オ) Google ranks intellectual humility higher than general cognitive ability.

(2) According to the article, for each of the following terms, choose the best description from (ア) to (ク).

a) ソフト面のスキル
b) プライドの高い自分
c) 全体的な認識能力
d) 創発的なリーダーシップ
e) 専門性

《選択肢》
(ア) an ability to take a lead when your team faces a problem and continue staying in the position with a strong sense of responsibility
(イ) pride and confidence developed through educational experience at famous universities
(ウ) being able to step in to lead when needed and willing to step back to let other people lead
(エ) general cognitive ability, including the ability to put together different kinds of information
(オ) personal qualities, such as motivation, leadership and flexibility, that are hard to quantify
(カ) extensive knowledge in a discipline which people acquire through repeated exposure
(キ) abilities that can be easily quantified by such things as school grades and test scores
(ク) being able to fiercely defend your strongly held opinions

(3) | Which of the following statements is NOT consistent with Laszlo Bock's views described (explicitly or implicitly) in this article? Choose the best answer.

(ア) Having a good academic record is not necessarily a bad thing if it reflects the skills required by the job you are applying for. What is problematic is your belief that all you need is a college degree because it guarantees the skills for any job.

(イ) Innovations have increasingly become a team effort. Therefore, it makes sense for a company like Google to recruit its employees who have a set of soft skills that cannot be easily predicted by their school records.

(ウ) Education has become increasingly important in order to find a secure high-paying job. Therefore, you should choose a university carefully and do your best in order to earn the best grades possible.

(エ) When the ultimate objective of a team is to work cooperatively and solve problems, who offers an idea is unimportant. What is important is to find the best idea among various solutions. This is the reason why intellectual humility becomes so important.

Part 3　Writing

Write one paragraph (about 100 words) in English explaining the advantages <u>**or**</u> disadvantages of the Internet.（配点 40 点）

Part 4　Writing

Write one paragraph (about 100 words) in English explaining what skills you have that make you a suitable student for Future University Hakodate.（配点 40 点）