

外国語科目 (数理・計算科学専攻)  
英語

16 大修  
時間 午後2時 - 午後3時

注意事項

1. つぎの3問中 2問を選択し解答せよ.
2. 解答は1問ごとに 別々の解答用紙に記入せよ.
3. 解答用紙ごとに必ず 問題の番号および受験番号を記入せよ.
4. 2問を超えて解答した場合は 採点されない可能性がある.

## 問 1

次の英文は、人が数学を学び研究を行なう動機に関して述べたものである。これを読んで下の (1) (2) に日本語で答えよ。

There is a real joy in doing mathematics, in learning ways of thinking that explain and organize and simplify. One can feel this joy discovering new mathematics, rediscovering old mathematics, learning a way of thinking from a person or text, or finding a new way to explain or to view an old mathematical structure.

This inner motivation might lead us to think that we do mathematics solely for its own sake. That's not true: the social setting is extremely important. We are inspired by other people, we seek appreciation by other people, and we like to help other people solve their mathematical problems. What we enjoy changes in response to other people. Social interaction occurs through face-to-face meetings. It also occurs through written and electronic correspondence, preprints, and journal articles. One effect of this highly social system of mathematics is the tendency of mathematicians to follow fads. For the purpose of producing new mathematical theorems this is probably not very efficient: we'd seem to be better off having mathematicians cover the intellectual field much more evenly. But most mathematicians don't like to be lonely, and they have trouble staying excited about a subject, even if they are personally making progress, unless they have colleagues who share their excitement.

William P. Thurston, "On Proof and Progress in Mathematics", Bull. AMS., 30 (1994) より

- (1) 1行目下線部の具体的内容を四つ挙げよ。
- (2) 枠で囲まれた部分を和訳せよ。

## 問 2

以下の英文は、1980年ころのハッカーに用いられた俗語をユーモアも交えて解説した「ハッカー辞典」の一部である。

- (1) 枠で囲まれた部分を和訳せよ。
- (2) 下の文脈において“canonical wonton soup” と “vanilla wonton soup” がどう違うと著者は述べているかを日本語で説明せよ。

### **CANONICAL** (*ki-nahn'i-kil*) *adjective*.

Usual; standard; ordinary. Example: “What is the canonical way to rejustify a paragraph in EMACS?”

This word has a somewhat more technical meaning in mathematics. For example, one sometimes speaks of a formula as being in canonical form. Two formulas such as  $9 + 3x^2 + x$  and  $3x^2 + x + 9$  are said to be equivalent because they mean the same thing, but the second one is in canonical form because it is written in the usual way, with the highest power of  $x$  first. Usually there are fixed rules you can use to decide whether something is in canonical form. The slang meaning is a relaxation of the technical meaning.

### **VANILLA** *adjective*.

Standard, usual, of ordinary FLAVOR. “It’s just a vanilla terminal; it doesn’t have any interesting FEATURES.”

When used of food, this term very often does not mean that the food is flavored with vanilla extract! For example, “vanilla-flavored wonton soup” (or simply “vanilla wonton soup”) means ordinary wonton soup, as opposed to hot-and-sour wonton soup.

This word differs from CANONICAL in that the latter means “the thing you always use (or the way you always do it) unless you have some strong reason to do otherwise,” whereas “vanilla” simply means “ordinary.” For example, when MIT hackers go to Colleen’s Chinese Cuisine, hot-and-sour wonton soup is the *canonical* wonton soup to get (because that is what most of them usually order) even though it isn’t the *vanilla* wonton soup.

Guy L. Steele Jr. (1983) “The HACKER’S DICTIONARY” より

wonton soup : 中華料理のワンタンスープ  
hot-and-soup : 中華の味付けの一種 (辛くて酸っぱい)

### 問 3

次の英文は、信号機の設定方法について取り上げたものである。これを読んで下の(1) (2) に日本語で答えよ。

**Example 1.1.** A mathematical model can be used to help design a traffic light for a complicated intersection of roads. To construct the pattern of lights, we shall create a program that takes as input a set of permitted turns at an intersection (continuing straight on a road is a “turn”) and partitions this set into as few groups as possible such that all turns in a group are simultaneously permissible without collisions. We shall then associate a phase of the traffic light with each group in the partition. By finding a partition with the smallest number of groups, we can construct a traffic light with the smallest number of phases.

For example, the intersection shown in Fig. 1.1 occurs by a watering hole called JoJo’s near Princeton University, and it has been known to cause some navigational difficulty, especially on the return trip. Roads *C* and *E* are one-way, the others two way. There are 13 turns one might make at this intersection. Some pairs of turns, like *AB* (from *A* to *B*) and *EC*, can be carried out simultaneously, while others, like *AD* and *EB*, cause lines of traffic to cross and therefore cannot be carried out simultaneously. The light at the intersection must permit turns in such an order that *AD* and *EB* are never permitted at the same time, while the light might permit *AB* and *EC* to be made simultaneously.

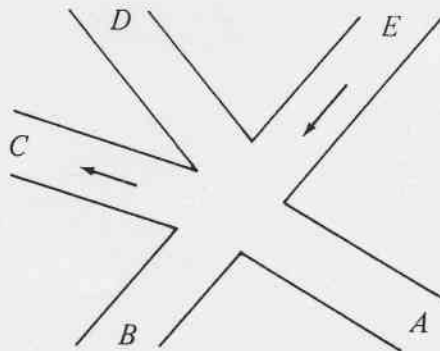


Fig. 1.1. An intersection.

A. V. Aho, J. E. Hopcroft and J. D. Ullman “Data Structures and Algorithms” より

- (1) 枠で囲まれた部分を和訳せよ。「turn」は「ターン」と訳して良い。
- (2) 下線部の「13 turns」は何かを列挙せよ。

(注) AB と EC が同時に通行できる、とされていることが気にかかるかもしれないが、左折、右折のレーンや誘導路が路面に設定されているので可能だと考えよ。