

平成24年度富山大学一般入試（前期日程）個別学力検査

解 答 訂 正

科 目 外国語（英語） 医学部医学科

訂 正

外国語（英語） 解答用紙（4－3）

3 (1) の (e) の解答欄

(誤) (e) If _____ when lost in the mountain.

(正) (e) If _____ when lost on the mountain.

前期日程

実施年月日
24. 2. 25
富山大学

科目

外国語(英語)

医学部医学科

注 意

1. 開始の合図があるまで、この問題冊子を開いてはいけません。
2. 問題は1ページから11ページにわたっています。問題冊子に不備がある場合は、直ちにその旨を監督者に申し出てください。
3. 解答用紙は4枚で、問題冊子とは別になっています。解答は、すべて解答用紙の所定の欄に記入してください。指定された解答用紙以外に記入した解答は、評価(採点)の対象になりません。
4. 受験番号は、4枚の解答用紙のそれぞれの上部の欄に記入してください。
5. 解答用紙は持ち帰ってはいけません。
6. 下書き用紙には、下書き用のマス目を書いてありますので、活用してください。
7. 問題用紙と下書き用紙(2枚)は持ち帰ってください。

1 次の文章を読み、問いに答えなさい。

For those who hunt for life on other worlds, water in its liquid form is perhaps the leading indicator. Life as we know it on Earth is based on water and carbon. And if organisms can prosper here in nasty environments — in the depths of the sea, in toxic waste, in water that is too hot, too cold, too acidic or too alkaline — why could they not prosper out there?

Scientists for years regarded liquid water as a solar system rarity, for there was no place apart from Earth that seemed to have the necessary physical attributes.

The past 20 years of space exploration, however, have caused what the astrobiologist* David Grinspoon calls a sea change* in thinking. It now appears that gravity, geology, radioactivity and antifreeze chemicals like salt and ammonia have given many “hostile” worlds the ability to assemble the pressures and temperatures that allow liquid water to exist. And research on Earth has shown that if there is water, there could be life.

On Mars and Venus, on Saturn’s moons Enceladus* and Titan*, and even on two outer-belt asteroids*, researchers have shown that the presence of liquid water is possible and even likely. Proof of life, of course, will come only when something — or someone — puts a drop of alien water under a microscope and sees a microbe*.

“Water and carbon-based life works well,” Dr. Grinspoon said. “That doesn’t mean it’s the only way, but it’s the only way we know, and it gives us something to look for.”

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Finding water in space, in the form of ice, has never been a problem. Hydrogen is the most common element in the solar system, and oxygen is not far behind. When the solar system formed about 4.5 billion years ago, a spiraling disc of dust and gas spun out from the Sun to produce the planets, their moons, and an enormous cloud of comets, planetoids* and other bits of cosmic flotsam*. Nature endowed much of this debris* with a generous helping of water ice.

Liquid water is another matter. The heat of the Sun may melt the ice, but in the vacuum of space there is little or nothing on the surface of most solar system objects to keep the heated molecules together, so they flash instantly away as water vapor. This process is called sublimation*.

The physics of sublimation are unforgiving*. Liquid water needs a delicate balance of temperature and pressure. Ice must be able to melt without boiling off, but the water must stay warm enough that it does not refreeze. On Earth, with a sea level atmospheric pressure of 14.7 pounds per square inch, water is liquid between 32 and 212 degrees Fahrenheit. On the unshadowed parts of our Moon, where the atmospheric pressure is zero and daytime

temperatures can exceed 260 degrees Fahrenheit, the surface ice is long gone.

Ice survives at very low temperatures, however, and the chunks of debris that linger in the chill reaches of deep space beyond Neptune make up the biggest source of water in the solar system today. These dirty snowballs re-enter the planetary system periodically as comets. When they get close enough to the Sun, the ice begins to sublimate, giving the comets their characteristic tail of dust and water vapor.

Many scientists say it is likely that much of the ice in the inner solar system came from comets. On Earth, cometary impacts early in the planet's history could have provided this raw material, and the Sun and atmospheric pressure would have done the rest. Earth is the only place in the solar system so far discovered where liquid is the default state of surface water. And Earth is where life proliferates.

(Guy Gugliotta, *New York Times*, truncated and slightly modified)

*注：astrobiologist 宇宙生物学者	sea change 一大変革
Enceladus エンケラドス(土星の衛星)	Titan タイタン(土星の衛星)
asteroid/planetoid 小惑星	microbe 微生物
flotsam 漂流物	debris 破片, ごみ
sublimation 昇華	unforgiving 厳しい

- (1) 下線部(A)の疑問文について、筆者の主張を50字程度の日本語で説明しなさい。但し、句読点も1字に数えます。
- (2) 下線部(B)の内容を70字程度の簡潔な日本語でわかりやすく説明しなさい。その際、“hostile”の意味する内容を明確にすること。但し、句読点も1字に数えます。
- (3) 以下の英文は第6段落以降(……線以降の本文)の記述から太陽系に存在する水の形態を英文で要約したものです。本文の内容に合うように下の(a)~(d)の空欄を与えられた語数で補い、英文を完成させなさい。但し、カンマ、ピリオドは語数には数えません。

Water in the form of ice has been easily found in space because _____ [8
words 以内] in the solar system, and ice can survive even _____ [5 words 以内] On
the other hand, water in the form of liquid requires _____ [8 words 以内] so
that it would _____ [6 words 以内]

(4) 本文の内容の記述と合っているものを、以下の(a)~(e)の選択肢から全て選び、記号を解答欄に書きなさい。

- (a) It is not until a drop of liquid water from another planet is put under a microscope and a microbe is actually seen that proof of life will finally be confirmed.
- (b) In space, when heated by the Sun, ice is unable to convert itself into a liquid form and stay as most solar system surfaces lack the conditions to hold water together.
- (c) Much of the space debris originating from the formation of the solar system became the source of liquid water.
- (d) Many scientists believe that the current abundance of water on Earth is only attributed to the cometary hits on Earth early in the planet's history.
- (e) You may think that liquid water is a standard form, but in the solar system, this form of water has been found only on Earth.

2 は次のページから始まります。

2 次の文章を読み、問いに答えなさい。

Every day about 60,000 people nationwide have surgery under general anesthesia. It's a combination of drugs that's made surgery more bearable for patients and doctors alike. General anesthesia reduces pain, knocks you unconscious and keeps you from moving during the operation. It is used for major surgery and when it's important that you be unconscious during a procedure. Life-saving procedures [open-heart surgery/impossible/like/without/or/^(A)be/brain surgery/would] general anesthesia.

General anesthesia affects your entire body. Other types of anesthesia influence specific regions: local anesthesia, such as a shot of novocaine* from the dentist, and regional anesthesia for everything below the waist. General anesthesia has three main stages: going under (induction), staying under (maintenance) and recovery (emergence). NIH*-funded scientists are working to improve the safety and effectiveness of all three.

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The drugs that help you go under are either breathed in as a gas or delivered directly into your bloodstream. Most of these drugs act quickly and disappear rapidly from your system, so they need to be given throughout the surgery. "When patients are going under, they experience a series of deficits," says Dr. Howard Nash, a scientist at NIH's National Institute of Mental Health. "The first is an inability to remember things. A patient may be able to repeat words you say, but can't recall them after waking up." Next, patients lose the ability to respond. "They won't squeeze your fingers or give their name when asked," Nash says. "Finally they go into a deep unconscious state."

Although doctors often say that you'll be asleep during surgery, research has shown that going under anesthesia is nothing like sleep. "Even in the deepest stages of sleep, by pushing you we can wake you up," says Dr. Emery Brown, an anesthesiologist at Massachusetts General Hospital in Boston. "But that's not the case with general anesthesia. General anesthesia looks more like a coma* — a reversible coma." You lose awareness and the ability to feel pain, form memories and move.

Once you've become unconscious, the anesthesiologist uses monitors and medications to keep you that way. In rare cases, though, something can go wrong. About once in every ^(B)1,000 to 2,000 surgeries, patients may gain some awareness when they should be unconscious. They may hear the doctors talking and remember it afterward. Worse yet, they may feel pain but be unable to move or tell the doctors. "It's a real problem, although it's quite rare," says Dr. Alex Evers, an anesthesiologist at Washington University in St. Louis. "Anesthesia awareness can lead to post-traumatic stress disorder*," a severe anxiety disorder that can arise after a terrifying ordeal*.

Scientists have developed strategies to identify and prevent anesthesia awareness. Small studies suggested that brain monitors might help. But in 2008, Evers and his colleagues reported the results of the largest study to compare different techniques. Brain monitoring did no better than standard monitoring in preventing anesthesia awareness. Addiction to alcohol or drugs increases the risk for anesthesia awareness, but doctors can't accurately predict who will be affected. A research team in Canada identified variations in a gene that may allow animals to form memories while under anesthesia. Ongoing studies are exploring whether this gene plays a role in anesthesia awareness in people. Other researchers are searching for genes that may affect how anesthetic drugs are processed, or metabolized*, by the body.

(Belle Waring and Harrison Wein, *NIH News in Health*, truncated and slightly modified)

*注：novocaine ノボカイン(麻酔薬の一種)

NIH アメリカ国立衛生研究所 (National Institutes of Health) coma 昏睡状態
post-traumatic stress disorder 心的外傷後ストレス障害 ordeal 苦しい体験
metabolize 代謝する

- (1) 下線部 (A) の語を並べ替えて文を完成しなさい。
- (2) 下線部 (B) は何を指していますか。本文中より最も適した単語 1 語を探し、その単語を解答欄に書きなさい。
- (3) 次の文章は、本文の第三段落以降(……線以降の本文)の内容の要点を箇条書きにまとめたものです。正しい要約文になるよう、各空欄を与えられた字数の日本語で埋めなさい。

- ・ (a) 20 字程度 によって体内に吸収された薬の大部分は、代謝が速いため (b) 10 字程度 必要がある。
- ・ 患者は、 (c) 5 字程度 状態とは異なり、 (d) 30 字程度 を失う。
- ・ まれに、患者が手術中に (e) 10 字程度 , 医師の話が聞こえるということがある。ひどい場合は (f) 30 字程度 。それは、手術後に心的外傷後ストレス障害を引き起こすような大変な問題となる。
- ・ この問題を予防するための (g) 5 字程度 の有効性について、エヴァースらの研究者は (h) 15 字程度 と報告している。
- ・ すでに、一つの遺伝子の変異が (i) 15 字程度 ことを突き止め、その人間への影響を探究している研究者たちがいる。

(4) 次の下線部に入れるのに最も適したものを (a)~(e) から一つ選びなさい。

General anesthesia is termed as “general” because _____.

- (a) many patients have surgery under this type of anesthesia
- (b) it is used more frequently than other types of anesthesia
- (c) it is commonly thought to be quite safe for most patients
- (d) it makes patients unaware and unable to feel pain in their whole body
- (e) the anesthesiologist has to keep monitoring the patient throughout the surgery

3 は次のページから始まります。

3

次の各問いに答えなさい。

(1) (a)～(e)のそれぞれについて、①の文とできるだけ近い意味になるように②の文を完成させなさい。但し、各文の①と同一の英文を書いて文意が繋がっても採点の対象とはなりません。

(a) ① The race is open to anyone over the age of sixteen.

② Anyone over the age of sixteen _____.

(b) ① The whole building crashed to the ground because of the explosion.

② The explosion _____.

(c) ① The leader found that his team members were easy to get on with.

② The leader had _____.

(d) ① Takayuki tried to laugh off the incident but he was clearly worried.

② Takayuki _____ although he was clearly worried about it.

(e) ① The campers lost on the mountain were able to survive the cold weather, thanks to their prior intensive training.

② If _____ when lost on the mountain.

- (2) 次の文章は“A Second Career”と題された記事です。空欄(a)~(j)に最も適した英単語を①~⑤から一つずつ選び、番号を解答欄に書きなさい。

Leafcutter ants start out (a) mandibles* as sharp as surgical scalpels*. But over the course of their lives, the (b) slicing of leaves into small disks dulls their V-shaped blades. (c) than retire, the ants shift their role to just carrying cut-off vegetation to the nest, (d) food production begins.

Observing the leafcutter ant named Panama's *Atta cephalotes*, University of Oregon's Robert Schofield and his team found that ants with dulled blades used about twice (e) energy and time to carve a leaf as (f) still sharp colleagues, triggering the job (g). “It's an advantage of social living (h) we humans are familiar with,” says Schofield. “People who can no (i) do certain tasks can still (j) worthwhile contributions to society.”

(Erin Friar McDermott, *National Geographic*, slightly modified)

*注：mandibles 下あご scalpels 外科用メス

- (a) ① with ② of ③ from ④ in ⑤ on
- (b) ① healthy ② clumsy ③ sporadic ④ temporary ⑤ repetitive
- (c) ① Later ② Rather ③ Other ④ Less ⑤ Worse
- (d) ① how ② which ③ what ④ where ⑤ whose
- (e) ① amount of ② as much ③ more the ④ of their ⑤ for greater
- (f) ① well as ② far as ③ their ④ they're ⑤ that
- (g) ① switch ② analysis ③ hunting
④ responsibility ⑤ maintenance
- (h) ① whether ② so ③ that ④ because ⑤ whenever
- (i) ① better ② way ③ more ④ longer ⑤ matter
- (j) ① do ② take ③ put ④ have ⑤ make

- 4 次の文章はある看護師の体験談です。この文章を読み、その内容を 200 語程度の英文に要約しなさい。なお、注には本文中の日本語を英語に訳した語彙が提示してありますが、使用は任意です。必ず使用しなければならないということではありません。

20 年前の話である。大学生 A 君が、昏睡状態*で ICU*に入室し、希望で母親が付き添うようになった。母親は大学まで出向き友人の声を週替わりで録音し、毎日耳元で聞かせた。また自らも廊下に響き渡る声で明るく語りかけていた。母親の愛情の深さ、信念を感じさせる日々であった。私も同じ気持ちで関わったが、母親のそれには到底かなわなかった。しかし、どんな刺激に対しても A 君からの反応はなく、人工呼吸器*の音だけが病室に響いた。

数カ月同じ状態が続いた。ふと、なんとなく分かっているのではないか…という印象を受けた。医師に報告し、脳波*も取ってみたが、結果に変化はなかった。あきらめようとするが、やはり何かある。しかし、周囲は気のせいだと言って取り合ってくれなかった。それでも私は母親と共に信じ、毎日刺激し、その「何か」を明らかにしようとした。

ある日母親が、「この子アイスクリームが大好きだったのよね…」とポツリと言った。「刺激を与えてみよう」と考え、医師の許可を得て、アイスクリームを買ってきた。十分に安全性を考慮した上で、微量を舌にのせてみた。すると A 君の顔の半分が口になった。笑ったのである！大きな口を開けてうれしそうに笑った。確かに笑っていた。2人で泣いた。1カ月後には一般病棟*に転出するまでに回復した。さらに数カ月が過ぎた頃、母親と一緒に「歩けるようになった」と病棟まであいさつに来てくれた。寝姿と違って2本の足でしっかり立っている彼は大きく見えた。

数年後、病棟入口にスーツ姿の男性が立っていた。「誰だろう…。業者かな？」と思いつつ「何でしょうか」と入口に向かった。そこには満面の笑みを浮かべた男性の姿があった。その笑顔はアイスクリームを食べた時の笑顔そのままだった。自然と涙が出てきた。数年遅れで無事に大学を卒業し、社会人となった姿を見せに来てくれたのだった。1人で来た彼の姿が大きく、大きく揺らいで見えた。

(<http://www.asahi.com/ad/clients/kango2011/episode.html>, slightly modified.)

*注：昏睡状態 coma

ICU intensive care unit (原文は「ハイケアユニット」(高度治療室))

人工呼吸器 respirator

脳波 EEG (electroencephalogram)

一般病棟 general ward