30 -3

医学部医学科英語入試問題

下記の注意事項をよく読んで解答してください。

◎注意專項

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1. 配付された問題冊子および解答用マークシート (受験番号のマークの仕方) に、それぞれ受験番号(4桁)ならびに氏名を記入 し、解答用マークシートの受験番号欄に自分の番 号を正しくマークしてください。

2. マークには必ず HBの鉛筆を使用し、濃く正しく マークしてください。

記入マーク例:良い例 角

悪い例の角のの

- 3. マークを訂正する場合は、消しゴムで完全に消し てください。
- 4. 衝突の記入機以外には何も記入しないでくださ ٥.
- 5. 解答用マークシートを折り曲げたり、汚したりし ないでください。
- 6. 「止め」の合図があったら、問題冊子の上に解答用 マークシートを重ねて置いてください。

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次の英文を読み、設問 1 . ~15. に最も適する答えを a . ~ d . の中から一つ選べ。

Olfaction is one of the two chemical senses: smell and taste. Both arise from interaction between chemicals and receptor cells. In olfaction, the chemical is volatile, or airborne. Breathed in through the nostrils or taken in via the throat by chewing and swallowing, it passes through either the nose or an opening in the palate at the back of the mouth, and moves toward receptor cells located in the lining of the nasal passage. As the chemical moves past the receptor cells, part of it is absorbed into the uppermost surface of the nasal passages, called the olfactory epithelium, located at the top of the nasal cavity. There, two one-inch-square patches of tissue covered with mucus dissolve the chemical, stimulating the receptors, which lie under the mucus. The chemical molecules bind to the receptors, triggering impulses that travel to the brain. There are thousands of different receptors in the cells of the nasal cavity that can detect as many as 10,000 different odors. Each receptor contains hair-like structures, or cilia, which are probably the initial point of contact with olfactory stimuli. Research suggests that the sensitivity of the olfactory system is related to the number of both receptors and cilia. For example, a dog has 20 times as many receptor cells as a human and over 10 times as many cilia per receptor.

The cribriform plate forms the roof of the nasal cavity. The olfactory nerve passes through openings in this bone and ends in the olfactory bulb, a neural structure at the base of the brain. From there, olfactory signals are diffused into the brain to areas including the amygdala. hippocampus, pyriform cortex (located at the base of the temporal lobe), and the hypothalamus. Offaction is the only sense that does not involve the thalamus. Offaction messages are especially intensive in the amygdala, a part of the brain responsible for emotions, which may help the unusual power of certain smells to trigger emotions and recollections based on memories from the past. Further, a person's reaction to smell is mediated by context. For example, the same smell present in body odor is responsible for the flavor of cheese. In the first case, the smell is perceived as negative. in the second, it is positive. In humans, olfaction intensifies the taste of food, warns of potentially dangerous food, as well as other dangers (such as fire), and triggers associations involving memory and emotion. Olfaction is an especially important sense in many animals. A predator may use it to detect prey, while prey may use it to avoid predators. It also has a role in the mating process through chemicals called pheromones, which can cause ovulation in females or signal a male that a female is in a sexually receptive state. Although the existence of human pheromones has not been verified, olfaction still plays a role in human sexual attraction, as well as in parenting. Mothers can usually identify their newborn infants by smell, and breast-feeding babies can distinguish between the smell of their mothers and that of other breast-feeding women. Researchers have also found that children are able to recognize their siblings by smell and parents can use smell to distinguish among

their own children. However, as people age the sense of smell diminishes, especially for men. By age 80, many men have almost no ability to detect odors. The intensity of a particular odor is strongly affected by adaptation. Odors may become undetectable after only a brief period of exposure. The sense of smell also plays an important role in the discrimination of flavors, a fact demonstrated by the reduced sense of taste in people with colds. The enjoyment of food actually comes more from odors detected by the olfactory system than from the functioning of the taste system. The olfactory and gustatory (taste) pathways are known to converge in parts of the brain, although it is not known exactly how the two systems work together. While an aversion to certain flavors (such as bitter flavors) is innate, associations with odors are learned.

- I. The word "interaction" is closest in meaning to
- a. the intensity with which chemicals bind to receptors
- b. how two things affect one another
- c. the chemical reaction caused by binding
- d. the link between two things
- 2. The word "volatile" is closest in meaning to
- a. evaporative
- b. hydrolytic
- c. synthesized
- d. condensed
- 3. The word "impulses" is closest in meaning to
- a. pressures
- b. forces
- c. catalysts
- d. signals
- 4. The word "diffused" is closest in meaning to
- a. concentrated
- b. consolidated
- c. extended
- d. distributed

- 5. Which of the following choices is closest in meaning to the first underlined sentence?
- a. Human pheromones are an important part of human sexual attraction, but their role in parenting has not been verified.
- b. Olfaction is distinguished by the lack of verification of human pheromones for sexual attraction and parenting.
- c. Whether or not smell is important in sexual attraction and parenting is unknown, but the role of pheromones in both of these functions is evident.
- d. While smell is known to influence human sex appeal and the parent child relationship, the presence of human pheromones remains unconfirmed.
- 6. The word "diminishes" is closest in meaning to
- a. abbreviates
- b. augments
- c. devalues
- d. wanes
- 7. Which of the following choices is closest in meaning to the second underlined sentence?
- a. The fact that people with colds will stop discriminating against certain foods because they cannot easily smell them demonstrates the connection between smell and flavor.
- b. That people with colds have difficulty tasting the flavor of different foods is proof that smell is connected with how well we recognize certain flavors.
- c. People with colds cannot recognize taste or smell because they have reduced discrimination of the role of olfaction in detecting flavor.
- d. The appreciation that people feel towards certain flavors is reduced when they have a cold, which shows that smell is important in how we taste things.
- 8. The word "aversion" is closest in meaning to
- a. distaste
- b. dissatisfaction
- c. dread
- d. partiality

- 9. According to the text, the receptor cells for olfaction
- a. are located in the roof of the nasal cavity.
- b. can detect up to 10,000 different olfactory stimuli.
- c. incorporate hair-like structures called cilia.
- d. all of the above.
- 10. According to the text, the sensitivity of the olfactory system is likely determined by
- a, the number of chemicals that bind to receptors.
- b. the number of receptors and cilia.
- c. the location of the chemical receptors.
- d. the location of the hair-like receptors.
- 11. According to the text, how is offaction different from all other senses?
- a. It relies on chemical stimulation.
- b. It uses the greatest number of receptors.
- c. It does not send signals to the thalamus.
- d. All of the above.
- 12. According to the text, the same smell sometimes causes different emotional responses because
- a. some smells remind us of pleasurable things.
- b. olfaction signals are very strong in the amygdala.
- c. our response to a smell depends on the circumstances.
- d. olfaction heightens our perception of food.
- 13. According to the text, human olfaction
- a. helps us to avoid predators, triggers associations of memory, and causes ovulation.
- b. activates memories, alerts us to dangerous food, and makes food taste stronger.
- c. is used by mothers to identify newborn infants and influences sexual receptivity.
- d. is involved in pheromone release, alerts us to hazards, and intensifies the taste of food.
- 14. According to the text, smell adaptation is
- a. the capacity to adjust to a smell.
- b. the ability to detect an odor.
- c. the specific sense that allows us to enjoy food.
- d. the loss of the sense of smell as people get older.
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- 15. According to the text, olfaction might increase our enjoyment of foods because
- a. smell reminds us of good foods such as cheese.
- b. smell is a stronger sense than taste.
- c. smell is innate and therefore helps us remember certain flavors.
- d. smell and taste signals are both processed in the same areas of the brain.

2 次の英文を読み,設問 1.~15.に最も適する答えを a.~ d.の中から一つ選べ。

The way the liver renews itself may be simpler than what scientists had been (1). A new study, appearing in the April 13 issue of *The Journal of Biological Chemistry*, provides new information on the inner workings of cells from regenerating livers that could (2) affect the way physicians make livers regrow in patients with liver diseases such as cirrhosis, hepatitis, or cancer. "The human liver is one of the few organs in the body that can regenerate from as little as 25 percent of its tissue." says Seth Karp, assistant professor of surgery at Harvard Medical School, Boston, and main author of the study. "It is not known how the liver does it, but our results provide some details of what makes the liver so unique."

Although organ regeneration has been in many animals, the details of how it happens at the cellular level are still not completely understood. So far, scientists have shown that cells that participate in tissue regeneration behave as if they were part of a growing organ in an embryo. In other words, the cells act as if the liver is growing, as do other organs in a developing embryo. Many of the proteins that organ regeneration have been identified, and scientists are now trying to make organs regrow by stimulating these proteins. Regrowing livers this way would be especially useful for patients whose livers are so damaged—say, by a tumor that has spread to most of the liver—that a large part would be removed. Unless such patients receive the right amount of liver transplant from an organ donor, they do not always survive. Quickly stimulating the growth of the remaining portion of their liver could be their only chance of survival.

To investigate how the liver regenerates, Karp and his colleagues set out to determine which proteins are involved in the regenerating cells. They were also interested in testing whether regenerating cells behave like embryonic ones, as is commonly assumed for other organs. New processes may explain why the liver is so uniquely capable of renewal and repair after injury, the scientists thought.

Karp's team considered two samples of mice. The first consisted of embryonic mice at stages of development, while the second was composed of adult mice that had two-thirds of their livers removed. Using techniques such as DNA microarrays—which determine which genes are active in a cell—and software programs that analyze the collected information, the scientists listed all the proteins that help the cells grow and proliferate in both samples.

The results were unexpected. The researchers noticed that only a few proteins were common to both processes. Proteins called transcription factors, which affect DNA in the cell's nucleus, were highly involved in the development of embryos' livers but not in adult liver regeneration. Instead, proteins that help cells proliferate were active in both the developing and regenerating livers.

These findings showed that a regenerating liver does not behave as a developing embryo.

Instead, regeneration could actually be only due to an increase in cells that multiply through regular cell divisions, a process called hyperplasia.

The new results may also have important medical (6). Transcription factors are known to be more difficult to manipulate than the other identified proteins. Since the transcription factors were not present in regenerating livers, it might be easier to stimulate liver regeneration by only activating the other identified proteins. "These results are very encouraging," Karp says. "Not only did we discover that the number of proteins involved in liver regeneration is relatively low, but they don't include transcription factors, so we may be closer to being able to stimulate liver regeneration than we thought."

The next step will be for scientists to understand whether the regenerating cells are stem cells. Studies have shown that adult stem cells are involved in the repair of many organs, but in the case of the liver, the cells repairing it through regeneration may simply be regular cells, not stem cells. "We think that the liver regrows through a relatively simple process, which could explain its ability to repair itself." Karp says.

- 1. Which word is best for blank 1?
- a. analyzing
- b. researching
- c. testing
- d. assuming
- 2. Which word is best for blank 2?
- a. knowingly
- b. significantly
- c. consistently
- d. suggestively
- 3. Which word is best for blank 3?
- a. proposed
- b. simulated
- c observed
- d. sought

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- a. encourage
- b. require
- c. induce
- d. benefit

5. Which word is best for blank 5?

- a. various
- b. indeterminate
- c. unknown
- d. reduced

6. Which word is best for blank 6?

- a. concerns
- b. procedures
- c. resolutions
- d. implications

7. Which word is best for blank 7?

- a. prodigious
- b. unexceptional
- c. abnormal
- d. conventional

8. According to the text, the new study provides information on

- a. how to regrow livers in patients with liver diseases.
- b. why the liver can regenerate while other organs cannot.
- c. the unique structure of liver cells.
- d. the functioning of cells that are involved in liver regeneration.

9. According to the text, previous research shows that cells in regenerating liver tissue

- a. act in the same way that cells in a developing organ do.
- b. behave the same as if they were part of a mature organ.
- c. return to the same state as a developing embryo.
- d. regenerate by stimulating certain proteins.

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英語

- 10. According to the text, scientists are trying to regrow organs by
- a. using liver cells taken from embryos.
- b. stimulating certain proteins that have been identified as important for organ regeneration.
- c. adding proteins called transcription factors to cells that will stimulate regeneration.
- d. transplanting the right amount of tissue into a patient.
- 11. According to the text, this research is important for patients with liver disorders because
- a. regenerating their livers rapidly may be the only way they can survive.
- b. they are not able to donate a portion of their livers for transplant.
- c. they may not be able to receive the right amount of liver in a transplant.
- d. some patients livers are too damaged to be able to regenerate the normal way.
- 12. According to the text, what were the scientists trying to discover about how the liver regenerates?
- a. They were researching which proteins are used by regenerating liver cells.
- b. They were trying to understand why the liver is the only organ capable of renewing itself.
- c. They wanted to see if liver cells that regenerate act similarly to cells in embryos.
- d. All of the above.
- 13. According to the text, the scientists conducted their research by
- a. comparing liver cells in embryonic and adult mice to see if the same proteins were active in both during regeneration.
- b. testing the DNA of mice embryos to identify those that proliferated the most.
- transplanting the livers from embryonic mice into adult mice whose livers had been mostly removed.
- d. adding active genes to the DNA microarrays of both embryonic and adult mice and then comparing their rates of regeneration.
- 14. According to the text, what was surprising about the results of the experiment?
 - a. The way cells grow in embryonic mice and the way cells regenerate in adult mice were different.
 - b. Transcription factor proteins were very active in adult mice but not in embryonic mice.
 - c. The proteins that help cells grow were not the same proteins that make cells proliferate.
 - d. The proteins that were active in adult mice and in embryonic mice were the same.

- 15. According to the text, the scientists now think that liver regeneration might be easier than was previously thought because
 - a. liver regeneration is not affected by cell hyperplasia.
 - b. it may not be necessary to use transcription factors for liver regeneration.
 - c. the transcription factors in adult cells are easier to manipulate than those in embryonic cells.
- d. they were able to identify the proteins involved in liver regeneration.

3	次の英文を読み、	1.~10.の下線部に入る最も適する答えを a.~ d.の中から一つ選べ

flumans are known for sporting big brains. On average, the size of primates' brains is nearly
double what is for mammals of the same body size nearly seven million years, the
human brain has tripled in size, with most of this growth occurring in the past two million years.
brain changes over time is tricky. We have no ancient brains to weigh on a scale. We
can, however, measure the inside of ancient skulls, and a few rare fossils have preserved natural
casts of the interior of skulls approaches to looking at early skulls give us evidence about the
volumes of ancient brains and some details about the relative sizes of major cerebral areas.
For the first two thirds of our history, the size of our ancestors' brains was within the range of
those of other apes living today. The species of the famous Lucy fossil, Australopithecus afarensis
had skulls with internal volumes of between 400 and 550 milliliters. chimpanzee skulls hold
around 400 ml and gorillas between 500 and 700 ml. During this time, Australopithecine brains
started to show subtle changes in structure and shape ape brains. For instance, the
neocortex had begun to expand, reorganizing its functions visual processing and toward other
regions of the brain. The final third of our evolution saw nearly all the action in brain size. Home
habilis, the first of our genus Homo, who appeared 1.9 million years ago, saw a modest hop in brain
size. an expansion of a language-connected part of the frontal lobe called Broca's area. The
first fossil skulls of Homo erectus. 1.8 million years ago, had brains averaging a bit larger than 600
ml.
From here the species embarked on a slow upward march, more than 1,000 ml by
500,000 years ago. Early Homo sapiens had brains within the range of people today, averaging 1,200
ml or more. As our cultural and linguistic complexity, dietary needs, and technological prowess took
a significant leap forward at this stage, our brains grew to accommodate the changes. The shape
changes we see accentuate the regions related to depth of planning, communication, problem solving
and other more advanced cognitive functions.
With some evolutionary irony, the past 10,000 years of human existence actually shrank out
brains nutrition in agricultural populations may have been an important driver of this trend

1.	а.	relative	b.	plausible
	С.	expected	d.	comparative
2.	а.	Beyond	b.	Across
	с.	Since	d.	About
3.	а.	Deciding	b.	Determining
	¢.	Accelerating	d.	Learning
4.	а.	Both	b.	Either
	с.	Some	d.	Contrary
5.	a .	nevertheless	-	furthermore
	с.	whereas	d.	however
6.		as compared with		related to
	c.	not including	d.	in addition to
-			١.	away from
7.		absent		past
	c.	outside	u.	pasc
8.	•	except	h	including
Ų.		besides		possibly
				•
9.	а.	reaching	b.	expanding
	с.	getting	d.	making
10.	а.	Improved	b.	Harmful
	с.	Reliable	d.	Limited

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英語

We live in an age in which you can Google BlackBerry, blog, podcast, and spam — yet none of these words existed (at least in their current senses) just a few years ago. The addition of vocabulary to the English language is, of course, nothing new. Every word in the dictionary was originally the brainchild of some wordsmith, lost in the mists of history, whose coinage caught on and was passed down the generations.

Words can be coined in several ways. Most new words are simply assembled out of old ones. We can figure out what a "defragmenter" is thanks to our familiarity with de-, fragment, and -er. The last decade has also given us deshopping (buying something to use it once and return it), gripesite (where you post comments about deficient products) and green washing (in which companies cover up polluting practices with eco-friendly PR). But where do the raw ingredients of words come from? The most obvious source, of course, is onomatopoeia — when a word resembles what it sounds like, as in oink, tinkle, barf, and woofer and tweeter. But onomatopoeia only applies to noisy things, and the resemblance is usually in the ear of the beholder.

A more fertile source of new words is the phenomenon called phonesthesia, "the feeling of sound," in which snippets of vowels and consonants remind people of something because of the way they are pronounced. Many words beginning with sn., for example, have something to do with the nose, because you can almost feel your nose wrinkle when you pronounce it. They include words for things associated with the nose (sneeze, sniff, snore, and Snuffleupagus) and for looking down your nose at someone (snarky, sneer, snicker, snippy, and snooty). Another example: cl- for a cohesive aggregate or a pair of surfaces in contact: clam, clamp, clap, clasp, cleave, clench, cluster, etc.

Why do words that share a teeny snatch of sound also sometimes share a teeny shred of meaning? These clusters grow from a nucleus of similar words that have coalesced for any number of reasons. They may be fossils of a linguistic rule that was active in an earlier period, or in a language from which the words were borrowed, or they might arise by sheer chance. But once similar words find themselves rubbing shoulders, they can attract or spawn new members owing to the associative nature of human memory.

We can infer that phonesthesia was the source of recent words like bling, bungee, glitzy, glom, gonzo, grunge, humongous, scuzzy, skank, and wonk. They are not built out of preexisting parts like prefixes, suffixes, and roots, and their sounds either remind people of their referents (as in bungee and glom) or vaguely resemble words with related meanings (as in glitter, glamour, and ritzy for glitzy, or scum, scuff, and fuzzy for skuzzy).

What kinds of things call out to be named? New words, one might guess, should materialize to name a concept that people need to talk about. That's why every hobby and profession quickly 38 -

develops a jargon. Even casual computer users command an impressive lexicon of new technical terms like modem, reboot, and upload. And in an age that professes to treat women and men as equals, what would we have done without "Ms.?"

But strangely enough, many concepts we long to name remain stubbornly nameless. We still don't have a good word for unmarried romantic partners, or for the current decade, nor a gender-neutral pronoun to replace "he or she." And wouldn't it be handy to have a word for a fact you can learn a hundred times without remembering it, or the early morning insomnia in which your bladder is too full to allow you to fall back to sleep but you're too tired to get up to go to the bathroom?

This unpredictability holds a lesson for our understanding of culture more generally. Like the (8) words in a language, the practices in a culture — fashion, ritual, common belief — must originate with an innovator, must then appeal to the innovator's acquaintances, and then to the acquaintances acquaintances until they become endemic to a community. The caprice in names suggests we should be skeptical of most explanations for other mores and customs.

- 1. The word "deficient" is closest in meaning to
- a. insufficient
- b. unsound
- c. excessive
- d. unsatisfactory
- 2. The word "practices" is closest in meaning to
- a. exercises
- b. preparations
- c. manners
- d. operations
- 3. The word "aggregate" is closest in meaning to
- a. pattern
- b. mass
- c. blend
- d. combination

- 4. The word "clusters" is closest in meaning to
- a. groups
- b. parcels
- c. parts
- d. inventions
- 5. The word "infer" is closest in meaning to
- a. suggest
- b. believe
- c. conclude
- d. apprehend
- 6. The word "vaguely" is closest in meaning to
- a. surely
- b. audibly
- c. memorably
- d. indistinctly
- 7. The word "lexicon" is closest in meaning to
- a. vocabulary
- b. dictionary
- c. concept
- d. idea
- 8. The word "unpredictability" is closest in meaning to
- a. casualness
- b. irregularity
- c. purpose
- d. informality
- 9. According to the text, how are the majority of new words created?
- a. They are constructed by combining existing word parts.
- b. People pass down new words for generations.
- c. Words are created to resemble old, familiar words.
- d. New words come from sounds that remind people of things.

- 10. According to the text, onomatopoeia is the creation of words that
- a. resemble fragments of sounds.
- b. help add feeling to sounds.
- c. sound like the things they are describing.
- d. sound good to the people who use them.
- 11. According to the text, the feeling of the sound used to pronounce words is important because
- a. people want to have a good feeling when they say words that describe good things.
- b. the way that words are spoken has a connection to the things they describe.
- c. individual vowel sounds have meanings that can affect the final meaning of the word.
- d. certain sounds are related to certain parts of the body.
- 12. According to the text, why might words with similar sounds have similar meanings?
- a. They might grow from a cluster of associated words that share the same sounds.
- b. They might be associated with certain periods of human memory.
- c. They may come from an older grammar rule that we do not use anymore.
- d. They were probably created at the same time that certain sound patterns were popular.
- 13. According to the text, why do new concepts need to have names created for them?
- a. People need a name for a new idea if they are going to talk about it.
- b. Every hobby or profession needs a lexicon to impress casual users.
- c. People call out for a new thing to be named because without a name the concept cannot be materialized.
- d. The lexicon of new technical terms is always changing, so new words need to be created to keep up.
- 14. According to the text, why do some concepts not have a name for them?
- a. It is sometimes handy not to have a name for a concept.
- b. Some ideas are too difficult to conceptualize and so cannot be named.
- c. The reason why some ideas do not have a name is not known.
- d. Some ideas are too uncertain to be able to make a name for them.

- 15. According to the last paragraph of the text, how does the naming of things help us understand our culture?
- a. Culture, like words, must appeal to the community to be accepted.
- b. Every element of a culture originally appealed to an innovator.
- c. Culture is designed to be liked by the people who use it.
- d. Since word creation is arbitrary, culture is probably also arbitrary.

5 設則1.~10. の英文のそれぞれについて、誤りを含んだ下線部の記号をa.~d. の中から一つ選べ。

- 1. The new changes in the agreement resulted in our not receiving services that we had previous been enjoying. (a) been enjoying.
- 2. While he may look like unfriendly and cold, in reality he is an easy person to get along with.
- 3. Despite our advertising the new program, and its seeming demand, we had few people sign up for the course than we had hoped.

 (a)

 (b)

 (c)
- 4. Most people believe in Einstein's Theory of Relativity, but, in light of some new evidences, several aspects of Einstein's ideas may need reconsidering.
- 5. After not succeeding for so many years, he surprised everyone by finally achieved his life's ambition.
- 6. His strictly upbringing helped prepare him for the hardships he had to face later on in life.
- 7. The music training that she received when she was young turned to be a huge advantage when she later studied languages.
- 8. Not wanting to hurt his feelings, we decided not to tell him the real reason which he was not chosen as the lead in the play.
- 9. In spite months of study and practice, he was unable to achieve a score higher than 97. (a) (b) (c) a score higher than 97.
- 10. No one could anticipated that the company would be able to recover so speedily from the disaster.

設間 i1. ~15. の英文中の空所に入れるのに最も適する答えを a. ~ d. の中から一つ選べ。

11. The conclusion that we drew the meeting was that the company's future outlook was
positive.
a. on
b. of
c. by
d. from
12. We were pleased that our conference had so many
a. attendees
b. attendances
c. attendants
d. attends
13 wishing to apply for the position must first fill out the form showing their education
background.
a. Them
b. Those
c. Who
d. They
14. The old campus in terms of transportation and access.
a. was poorly location
b. was poor location
c. was poorly located
d. was poor located
15. His communication and interpersonal skills mean that he is very good people.
a. with
b. for
c. at
d. by