令和４年度
入学試験問題

英　　語

注　意　事　項

(1) この問題用紙は１３ページあります。
(2) 問題は，指示があるまで開かないでください。
(3) それぞれの問いの指示に従って解答してください。
(4) 解答は，解答用紙の解答欄にマークすること。例えば（　４　）と表示のある問いに対しては解答番号４の行にマークしてください。
(5) 問題冊子のどのページも切り離さないでください。
(6) 印刷不鮮明，ページの落丁・乱丁等がある場合は，静かに手を挙げて試験監督者に知らせてください。

（令和４年１月30日　一般入試・前期）

（問題は次ページから始まる）

Follow instructions in sections A-C and answer items 1-15. Ensure that your choices correspond to the correct number on the marksheet.

(A) Complete the following sentences with the best word or phrase.

My comment is not so (1) a disagreement with your argument as a query about previous models.
(1) ア good　　イ better　　ウ much　　エ more

They objected (2) a new energy plant near the scenic village.
(2) ア build　　イ building　　ウ to build　　エ to building

Sadly, one of my university classmates (3) to colon cancer last year.
(3) ア passed　　イ perished　　ウ deceased　　エ succumbed

The global economy is expected to shrink as a result of the coronavirus pandemic. Governments are (4) unprecedented stimulus to prevent further long-term damage.
(4) ア banning　　イ restoring　　ウ hampering　　エ unleashing

(B) Choose the answer that is closest in meaning to the <u>underlined</u> words.

(5) I'm afraid I have to <u>disagree</u> with your decision.
ア take issue
イ take matter
ウ take conflict
エ take contention

(6) Because RNA viruses use error-prone RNA polymerase for replication, their genomes <u>inevitably</u> acquire mutations.
ア are bound to
イ are assumed to
ウ are equivocal to
エ are susceptible to

(C) Complete the following paragraphs with the best word.

In 1961 the biologist Leonard Hayflick discovered that cultured normal human fetal cells would divide a finite number of times. This (7) a sixty-year-old dogma (8) which it was believed that all cells are immortal.

(7) ア prevailed イ entrenched ウ overturned エ reestablished
(8) ア by イ in ウ of エ to

At the origin of life, the primitive genetic code was surely smaller and simpler than the modern one. It probably included only a few amino acids, or perhaps a few classes of similar amino acids. At some point in its history the code may have functioned as a pure doublet code, ignoring the third base in each codon and specifying no more than (9) amino acids. Then the translation mechanism grew more discriminating, and a few more amino acids were added to the repertory. My question is: Why did the process of differentiation stop at twenty amino acids? There are plenty of (10) codons left, and there are other amino acids that need to be gotten into proteins. So why not expand the code further? One possible answer is that the code is such a vital engine of life that it has been (11) since the earliest stages of evolution. Tinkering with a mechanism so crucial to every cell's survival is too costly.

(9) ア eight イ twelve ウ sixteen エ twenty
(10) ア space イ spare ウ spear エ sparse
(11) ア variable イ immutable ウ retractable エ commutable

Ideas don't exist except when they're communicable. The best idea in the world will do almost (12) one any good if it can't be spoken or written down or drawn or sung or danced or carved or otherwise passed on. This is especially true for the professional scholar, since in that (13) the ideas are, effectively, the sentences they're in. From this perspective people don't have ideas; they have sentences that communicate.

(12) ア no　　イ any　　ウ some　　エ every
(13) ア realm　　イ cohort　　ウ paradox　　エ conjecture

Before the COVID-19 pandemic of 2020, emissions of carbon dioxide were rising (14) about 1% per year over the previous decade, with no growth in 2019. Renewable energy production was expanding rapidly amid plummeting prices, but much of the renewable energy was being (15) alongside fossil energy and did not replace it, while emissions from surface transport continued to rise.

(14) ア at　　イ by　　ウ on　　エ from
(15) ア depicted　　イ deployed　　ウ deposited　　エ diminished

Read the passage below and follow instructions in sections D and E. Ensure that your choices correspond to the correct number on the marksheet.

P1: A Japanese company and Kyoto University have joined forces to develop what they hope will be the world's first satellites made from wood by 2023. Sumitomo Forestry said it has started research on tree growth and the use of wood materials in space. The partnership will begin experimenting with different types of wood in extreme environments on Earth. Space junk is becoming an increasing problem as more satellites are launched into the atmosphere. Wooden satellites would burn up without releasing harmful substances into the atmosphere or (16)raining debris on the ground when they plunge back to Earth.

P2: Sumitomo Forestry, part of the Sumitomo Group, which was founded more than 400 years ago, said it would work on developing wooden materials

highly resistant to temperature changes and sunlight. According to a spokesman for the company, the wood being used is an "R&D secret".

P3: Experts have warned of the increasing threat of space junk falling to Earth, as more spacecraft and satellites are launched. Satellites are increasingly being used for communication, television, navigation, and weather forecasting. Space experts and researchers have been investigating different options to remove and reduce the space junk.

P4: There are nearly 6,000 satellites circling Earth, according to the World Economic Forum (WEF). About 60% of them are (17)defunct (space junk). Research firm Euroconsult estimates that 990 satellites will be launched every year this decade, which means that by 2028, there could be 15,000 satellites in orbit. Elon Musk's SpaceX has already launched more than 900 Starlink satellites and has plans to launch thousands more.

P5: Space junk travels at an incredibly fast speed of more than 22,300 miles per hour and can cause (18)considerable damage to any objects it hits. In 2006 a tiny piece of space junk collided with the International Space Station, taking a chip out of the heavily reinforced window.

(D) Find the underlined words in the passage and choose the best substitute.

(16) Which choice is closest in meaning to raining in paragraph 1 (P1)?

ア pouring　　イ pulling　　ウ reaping
エ drizzling　　オ wrecking

(17) Which choice is closest in meaning to defunct in paragraph 4 (P4)?

ア out of sight　　イ out of orbit　　ウ out of energy
エ out of range　　オ out of commission

(18) Which choice is closest in meaning to considerable in paragraph 5 (P5)?

ア sensible　　イ moderate　　ウ substantial
エ intermittent　　オ inconspicuous

(E) Choose the best answer to the following questions.

(19) What kind of wooden materials will the satellites be made from?
ア R&D
イ pine
ウ balsa
エ bamboo
オ thermotolerant

(20) According to the passage, which statement is true about satellites?
ア Satellites have become obsolete.
イ Satellites have become less reliable.
ウ Satellites have become more complex.
エ Satellites can be recovered and recycled.
オ Satellites are saturating the earth's orbit.

(21) Wooden satellites aim to reduce the costs of producing satellites used for communication, television, navigation, and weather forecasting.
ア TRUE
イ FALSE

(22) According to the passage, what is the disadvantage of using wooden satellites?
ア Their longevity is unknown.
イ They burn up during re-entry.
ウ They do not last as long as metal satellites.
エ They are more likely to break up and damage the space station.
オ Not mentioned in the passage.

(23) Which of the following choices is most appropriate as a title for this passage?
ア Wooden satellites cut space junk
イ Japan sends wooded satellites into space
ウ Wooden satellites replace traditional satellites
エ After 400 years, Sumitomo Forestry goes to space
オ Japan is making wooden satellites to declutter space

Read the passage below and follow instructions in sections F and G. Ensure your choices correspond to the correct number on the marksheet.

P1: It is useful to take your place at the bottom of a hierarchy. It can aid in the development of gratitude and humility. There are people whose expertise exceeds your own, and you should be wisely pleased about that. There are many valuable (24)niches to fill, given the many complex and serious problems we must solve. The fact that there are people who fill those niches with trustworthy skill and experience is something for which to be truly thankful.

P2: It is better to (25)presume ignorance and invite learning than to assume sufficient knowledge and risk the consequent blindness. It is much better to make friends with what you do not know than with what you do know. For this reason, the Tarot deck beloved by intuitives, romantics, fortune-tellers, and scoundrels alike contains within it the "Fool" as a positive card.

P3: The Fool is a young handsome man journeying in the mountains, sun shining brightly upon him, about to carelessly step over a cliff (or is he?). His strength, however, is precisely his willingness to risk such a drop; to risk being once again at the bottom. No one unwilling to be a foolish beginner can learn. It was for this reason, among others, that the Swiss psychiatrist Carl Jung (26)regarded the Fool as the archetypal precursor to the figure of the equally archetypal Redeemer, the perfected individual.

P4: Consider, for example, the Disney heroes Pinocchio and Simba, as well as J. K. Rowling's magical Harry Potter. Pinocchio begins as a wooden-headed marionette, the puppet of everyone's decisions but his own. The Lion King has his origin as a naive cub, the unwitting pawn of a treacherous and malevolent uncle. The student of wizarding is an unloved orphan, with a dusty cupboard for a bedroom, and Voldemort for his archenemy. Great mythologized heroes often come into the world, likewise, in the most meagre of circumstances, and in great danger. But today's beginner is tomorrow's master.

(F) Find the underlined words in the passage and choose the best substitute.

(24) Which choice is closest in meaning to niches in paragraph 1 (P1)?

ア views
イ spaces
ウ callings
エ divisions
オ characteristics

(25) Which choice is closest in meaning to presume in paragraph 2 (P2)?

ア deny　　イ suppose　　ウ pretend
エ conclude　　オ hypothesize

(26) Which choice is closest in meaning to regarded in paragraph 3 (P3)?

ア viewed　　イ compared　　ウ rendered
エ contrasted　　オ juxtaposed

(G) Choose the best answer to the following questions.

(27) What does the author suggest in paragraph one (P1) ?

ア The most useful people reside at top order.
イ A person is most useful when told what to do.
ウ It is easier to gain experience when there is none.
エ The unlucky start at the bottom and should accept it.
オ One can take advantage of a lower position and learn from those with more experience.

(28) According to the passage, the "Fool" in Tarot decks signifies a pathetic figure.

ア TRUE　　イ FALSE

(29) Which of the following is not considered to be the archetypical Fool?

ア Simba　　イ Pinocchio　　ウ Voldemort
エ Harry Potter　　オ None of the above.

(30) According to the author, a person must be unwilling to play the Fool in order to learn.

ア TRUE　　イ FALSE

(31) In this passage, the Fool eventually (31) himself.

ア sees　　イ blames　　ウ accepts

エ forgives　　オ redeems

Read the article below and follow instruction in section H. Ensure that your choices correspond to the correct number on the marksheet.

P1: Climate change threatens the long-established synchronization of seasonal pollinator activity and flowering time. Temperature strongly affects the emergence of pollinating insects after hibernation. By contrast, flowering relies heavily on the time of exposure to light (the photoperiod), which is not subject to climate change. Thus, pollinators might find themselves critically short of nutrition early in the season.

P2: In contrast to hypothesis-driven research, scientific discovery often springs from careful observation of natural phenomena. Pashalidou *et al.* noticed a previously unreported natural behavior: Using their mouth parts, bumble bees deliberately damaged leaves of a variety of plant species. The authors suspected that this behavior might be related to a shortage of pollen, the bees' sole source of protein. Therefore, the researchers compared the leaf-damaging behavior exhibited by experimental pollen-starved colonies of bumble bees with that of worker bees from well-fed nests. The results were consistent across years and experimental situations (laboratory settings as well as free-flying colonies): Pollen-starved workers made considerable efforts to puncture holes in the leaves of flowerless plants, whereas workers from well-fed colonies rarely did so.

P3: But why? Pashalidou *et al.* then discovered a dramatic effect of the leaf-damaging behavior on flowering phenology. When exposed to leaf-biting bees, the black mustard plant (*Brassica nigra*) flowered two weeks earlier and tomato plants (*Solanum lycopersicum*) came into flower a month sooner

than would normally be expected. Thus, bumble bees appear to perform a low-cost, but highly efficient, trick to accelerate flowering in plants around their nest under conditions when flower pollen resources are most urgently needed for colony growth.

P4: Many intriguing questions surround the evolution of leaf-biting behavior as well as its adaptive importance. How might this behavior have arisen? One possibility is that individual bees figured out that leaf-biting results in future rewards, and that these bees remember the very plants they have damaged and return to them weeks later to reap the benefits of their efforts. This is perhaps not wholly implausible, given that bumble bees have developed other impressively innovative solutions to access rewards, and their spatial memories can last a lifetime. However, it is unlikely that bees can learn that a link exists between an action and a reward that occurs a month later. Also, worker bees in the wild rarely survive longer than one month.

P5: An alternative explanation for how leaf-biting first arose is that individual bees receive an immediate benefit in addition to the more long-term one for colony fitness. For example, bees might extract a substitute protein source from leaf-biting, such as plant sap. However, Pashalidou *et al.* rejected this possibility because most leaf-damaging interactions seemed too brief for bees to imbibe plant juices in appreciable quantities. Perhaps pollen-starved bees just bite plant parts indiscriminately in the hope that these might conceal some pollen. This too is unlikely, because even entirely inexperienced bees can tell flowers from vegetative parts. Bumble bees sometimes extract nectar from hard-to-access flowers by puncturing floral structures, a technique called nectar robbing. Inexperienced workers attempt this at various flower parts, until they figure out the reward location.

P6: One might also wonder why bees would bite holes in vegetative parts of plants that do not even have flowers, instead of searching for plants that do. Unselective perforation of leaves in a bee colony's flight range will not confer much profit. For example, spreading the perforation treatment too far from the native nest might be more likely to benefit competing bees with nearby

nests. In addition, many plants, such as mosses or ferns, will never provide any useful pollen for bees, nor will it be beneficial to bite the leaves of plants that are past the blooming stage. Perhaps bumble bees can use flower buds as cues that flowering is on the horizon. Thus, the bees would know that these plants are worth their effort to further speed up flowering. Future studies should develop a plausible evolutionary scenario for how the first mutant bees that began leaf-biting might have conferred a sufficient selective colony-fitness advantage for this trait to spread through a population.

P7: Turning to plants, there are many equally fascinating questions relating to why an adequate response to bee-driven leaf damage would be to accelerate flower development. One possibility is that such damage is interpreted by the plants as an ongoing herbivore attack; annual plants, therefore, might force an earlier flowering period before the plant's untimely demise. Plants are known to speed up their flowering as a response to various stressors, but there are no known examples of such a response to herbivory. An adaptive explanation might be that plants "want" to respond to bees that are signaling a dearth of food, because this also means there might be an excess of pollination services available. However, there will also be an opposing selective pressure to synchronize flowering with potential mates within plant species, which would be a disadvantage to individual plants that move their flowering forward.

P8: A further reason why plants might fast-track flowering is that they are simply manipulated into doing so against their own advantage, but to the benefit of bumble bees. Mechanical damage made with metal forceps and razors does not have the same effect on flowering times as does perforation by bees. Thus, it remains possible that bees inject chemicals into the plants to promote flowering. If so, scientists might realize a horticulturist's dream by deciphering the molecular pathways through which flowering can be accelerated by a full month. An encouraging interpretation of the new findings is that behavioral adaptations of flower visitors can provide pollination systems with more plasticity and resilience to cope with climate change than hitherto suspected.

(H) Choose the best answer to the following questions.

(32) The primary purpose of the article is to
ア represent a diverse array of data modalities.
イ share the findings of the multi-year research project.
ウ condemn the research that led to the scientific discovery.
エ introduce the novel method in preventing climate change.
オ assert why hypothesis-driven research is less effective for scientific discovery.

(33) According to the article, global warming and the resulting large-scale shifts in weather threaten to alter the synchrony of pollinator-plant relationship by changing the timing of flowering.
ア TRUE
イ FALSE

(34) Which of the following statements is factual according to paragraph 2 (P2)?
ア Bumble bees from satiated group rarely damaged the plants.
イ Pollen-starved workers inadvertently damaged leaves of a variety of plant species.
ウ Worker bees from the pollen-deprived colonies inflicted considerably small amounts of leaf damage.
エ The researcher's findings for the leaf-damaging behavior of pollen-deprived bees were irreproducible outdoors.
オ None of the above.

(35) As used in paragraph 4 (P4), "implausible" is closest in meaning to
ア credible.
イ achievable.
ウ compelling.
エ persuasive.
オ inconceivable.

(36) Which choice best describes the relationship between paragraph 4 (P4) and paragraph 5 (P5)?

ア P5 refutes the central claim stated in P4.

イ P5 argues against the model postulated in P4.

ウ P5 addresses additional issues not covered in P4.

エ P5 provides practical evidence to the proposals put forth in P4.

オ P5 illustrates the concepts described in more general terms in P4.

(37) Which statement best describes the main idea of paragraph 7 (P7)?

ア Accelerated flowering is a disadvantage to annual plants.

イ Pollen-foraging efficiency is maximized by natural selection in the eusocial organism.

ウ Understanding of the bumble bees' instinctive behavior could help farmers manage their crops.

エ Global and anthropogenic environmental changes have the potential to disrupt ecologically important interactions.

オ None of the above.

(38) According to the article, which of the following choices is the most likely explanation for how bee bites accelerate flowering?

ア Bumble bees provide some cues to the plants that are specific to the bees.

イ Plants accelerate their flowering in response to various external stresses including bee bites.

ウ Bumble bees extract nectar from hidden flowers by using a technique called nectar robbing, which speeds up flowering.

エ Lifetime lasting spatial memories allow individual bees to memorize the plants they have damaged and return to them later to harvest reward.

オ Bumble bees have developed an effective way to overcome asynchrony with plant blooming, which is widespread among bumble bee species.

(39) Which choice provides the best evidence for the answer to the previous question?

ア P2, lines10-12 ("Pollen-starved . . . did so.")

イ P4, lines 6-8 ("bumble bees . . . a lifetime.")

ウ P6, lines 8-9 ("bumble bees. . . the horizon.")

エ P7, lines 8-10 ("An adaptive . . . available.")

オ P8, lines 3-5 ("Mechanical . . . bees.")