

平成30年度
京都大学大学院生命科学研究科修士課程
筆答試問

英 語
問 題

注意事項

- 1) 解答時間は、60分間である。
- 2) 満点は、100点である。
- 3) 全部で2問題ある。両方の問題を解答せよ。
- 4) 解答は、問題ごとに別々の解答用紙1枚を使用すること。不足する場合は裏面を使用すること。
- 5) 解答時には、まず問題番号をそれぞれ所定の欄に明記すること。

問題 1

Part 1.

The following text is an edited excerpt from a review of two scientific papers, published in the journal “eLife”. Read the text and answer the questions in English.



(Source: Xiuwei Zhang and Nir Yosef, eLife, DOI: 10.7554/eLife.25654)

Questions:

1. What is an example in the above excerpt of a transient factor that influences cell identity?
Answer with a complete sentence.
2. What technology is cited as making it possible for researchers to investigate identity factors?
3. What does the idiom ① “**opens the way**” mean above? Explain in your own words.
4. What does ② “**this question**” refer to above?
5. What does ③ “**they**” refer to above?
6. What does similarity in gene expression profiles indicate, according to this excerpt?

Part 2.

Question 1: In the following sentences, a word has been left out (indicated by "____" in the sentence). For the four choices given, choose the word that best completes the sentence both scientifically and grammatically, and write the corresponding letter in the answer key.

(1) To ensure reproducibility, researchers should write detailed records of how experiments ____ performed in their lab notebook.

- (A) were (B) is (C) did (D) always

(2) The enzyme changes conformation when it binds to ____ substrate.

- (A) some (B) its (C) all (D) their

(3) Proteins are composed of amino acids ____ together in a polypeptide chain.

- (A) bind (B) all (C) linked (D) join

(4) Single-stranded DNA and RNA can ____ together.

- (A) translate (B) hybridize (C) associated (D) transform

(5) DNA replication requires ____ of the two parent strands.

- (A) joining (B) transient (C) unwinding (D) removal

(6) Chromosomes must condense in _____ for cell division.

- (A) action (B) condensation (C) anticipation (D) preparation

(7) Cytokines bind to a region of cytokine receptors known as the ligand-binding domain, ____ sticks out from the cell surface.

- (A) it (B) which (C) partially (D) and

(8) All told, this work stands as a triumph of scientific imagination, a lucid illustration that we need ____ be constrained by the rules of engagement prescribed within the genome.

- (A) to (B) always (C) moreover (D) not

(9) An individual centriole ____ of a central hub surrounded by an outer wall that contains a nine-fold symmetric array of microtubules.

- (A) consists (B) made (C) part (D) forms

(10) Taken together, our data suggest a new ____ for protein phosphorylation in the regulation of nuclear envelope breakdown.

- (A) finding (B) research (C) element (D) role

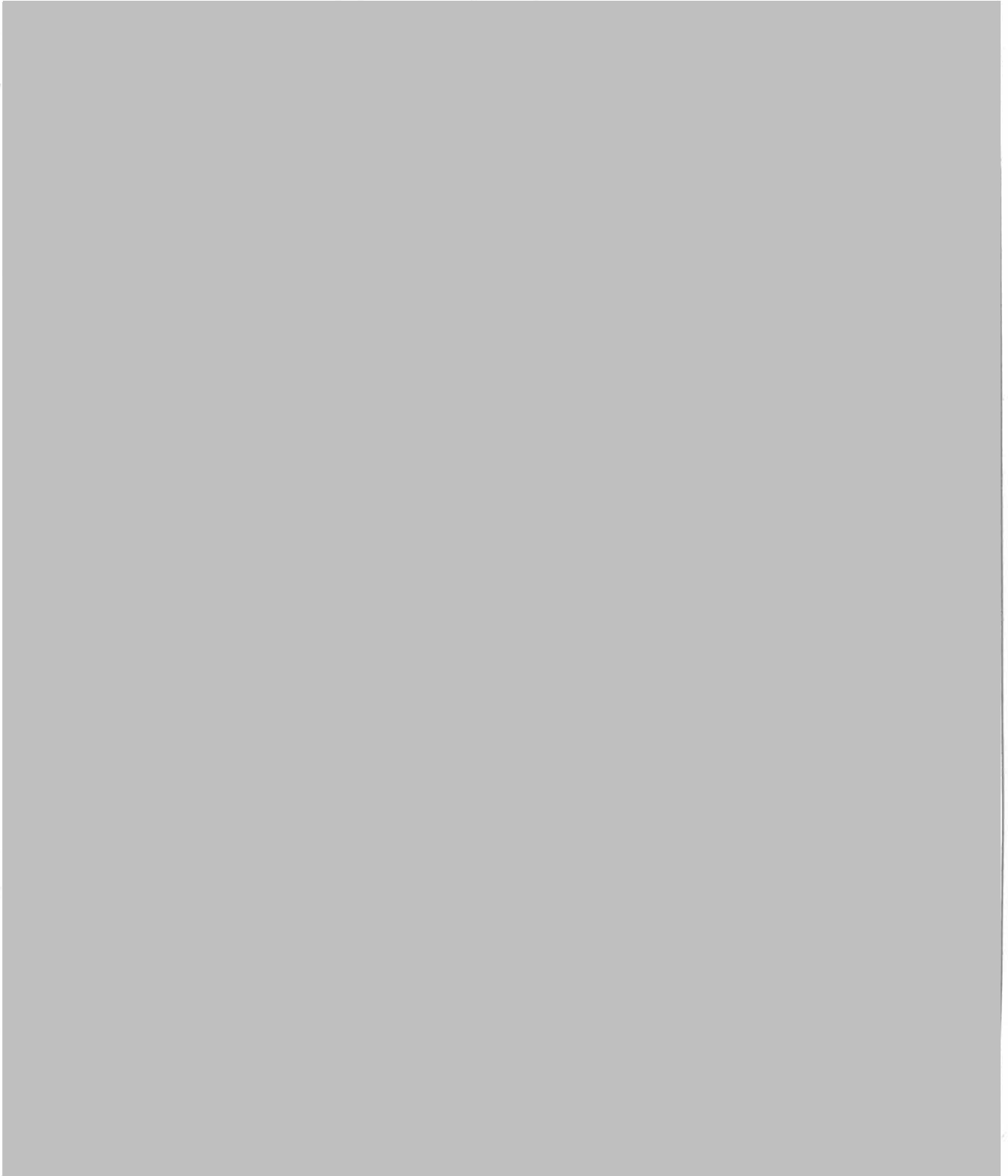
Question 2: Pick three of the following biological entities labeled 1–10 and write a one-sentence definition (10-30 words) in English, using your own words. Write the word in your answer key, followed by your definition. Definitions will be graded based on English grammar and content.

(Example: *Genome*: The genome is the complete DNA sequence of an organism.)

1. virus
2. chromatin
3. nucleus
4. kidney
5. enzyme
6. antibody
7. transcription factor
8. metabolism
9. mutation
10. ribosome

問題2

次の文章は、キャンベル生物学第9版第10章「光合成」の概説から抜粋したものである。
文章を読んで、問1から問5の全てに答えよ。



註) carcass: 動物の死骸

問1. 下線部①を日本語に訳せ。ただし、autotrophs、*auto-*、および *trophos* は英語表記のままでも良い。

問2. 下線部②を日本語に訳せ。

問3. 括弧[I]および[II]に入る語句の組み合わせとして正しいものを選べ。

- A. composers / parasites
- B. producers / consumers
- C. losers / winners
- D. curators / predators

問4. 括弧(a)–(e)に相応しい語句を下から一つずつ選べ。なお、同じ文字で示された空欄には同じ語句が入るものとする。

remains, pathological, chemical, viruses, thermal, nematodes, historical, vacuoles,
prokaryotes, glycan, ecological, physical, light

問5. この概説に最も相応しいタイトルを選べ。

- A. The role of chloroplasts
- B. The power of plant biology
- C. The process that feeds the biosphere
- D. The factors that regulate photosynthesis