熊本大学大学院自然科学研究科（博士前期課程）理学専攻地球環境科学講座入試問題（平成 21 年 1 月 22 日）
英語【その１】

次の問[I]，[II]，[III]に答えよ。解答には，設問ごとに１枚の解答用紙を用い，各解答用紙の左上の[　]に，解答する設問番号を記入すること。

［Ｉ］次の英文を和訳せよ。

During Early Cretaceous time, India broke away from Gondwana and began moving north. At the same time, a subduction zone formed along the south−facing margin of Asia where oceanic lithosphere was consumed. Partial melting of this descending oceanic lithosphere generated magma, which rose to form a volcanic chain and large granitic intrusions in what is now Tibet. India eventually approached this chain and destroyed it as it collided with Asia to form a collision orogen. As a result, two continental plates became sutured—India and Asia were now one. The exact time of India's collision with Asia is uncertain, but sometime between 40 and 50 million years ago. India's northward drift rate decreased abruptly, from between 15 and 20 cm per year to about 5 cm per year. Because continental lithosphere is not dense enough to be subducted, this decrease in rate seems to mark the time of collision and India's resistance to subduction.

Because of its low density and resistance to subduction, the leading margin of India was underthrust beneath Asia, causing crustal thickening, thrusting, and uplift. Sedimentary rocks that were deposited in the sea south of Asia were thrust northward into Tibet, and two major thrust faults carried Paleozoic and Mesozoic rocks of Asian origin onto the Indian plate. Rocks that were deposited in the shallow seas along India's northern margin now form the higher parts of the Himalayas.

(orogen：造山帯)

（出典 : Reed Wicander and James S. Monroe, 1993, Historical Geology (Sec.ed). West Pub.Co）

[II] 以下の英文ニュース紙の記事を読み，問いに答えよ.

When an earthquake occurs, a certain amount of time elapses before destructive seismic energy hits nearby population centers. Though this time is measured on the order of seconds, depending on the proximity of the rupture to a given city or town, a new public safety program in Japan is taking advantage of the fact that seismic energy travels slower than electronic communication.

In this program, the Japan Meteorological Agency (JMA) rapidly determines the hypocenter (earthquake epicenter and focal depth) and magnitude of the earthquake by using real−time data from stations near the hypocenter. The distribution of strong ground shaking is anticipated quickly, and then the information is delivered immediately to government officials, representatives from various industries, members of the news media, and individuals before strong ground shaking reaches them. For example, on receiving the warning, the control room of a railway company can send an emergency notice to all train drivers to stop their trains immediately, elevators in buildings can be triggered to stop at the nearest floor and open their doors automatically, and surgeons can temporarily suspend their surgical operations to avoid risk to patients on operating tables.

This innovative new service, called Earthquake Early Warning (EEW), started nationwide in Japan and became fully operational in October 2007. This service is definitely different from earthquake prediction.

Even though the interval between the delivery of EEWs and the time when strong shaking reaches people is relatively short (counted in seconds), EEWs are useful and powerful tools for reducing the risk of a major disaster in the event of an earthquake, by making people aware that strong ground shaking will soon occur. EEWs are expected to be effective for online control of traffic and lifeline systems, and for emergency action.

In addition to triggering trains to slow down, elevators to stop, or hospitals to suspend surgical operation, other examples of the application of EEW include transferring important data from computers to disks immediately and shutting down electronics automatically. Further, people receiving general EEWs can choose to take emergency precautions (for example, taking shelter under a desk, or keeping away from glass windows) at homes, schools, offices, halls, and shopping malls.

（EOS, 89(8), 2008 より抜粋）

問1. この記事は何について書かれているか？日本語で簡潔に述べよ。
問2. 下線部を和訳せよ。

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英語【その２】

［III］以下の図１，２は，ある地質時代の大陸の分布と恐竜化石の産地を表している。これらの図を見ながら，図の説明文の下線部①－⑤を英訳せよ。

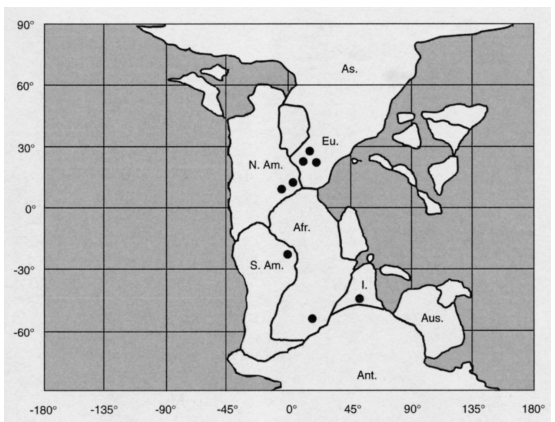

図１．

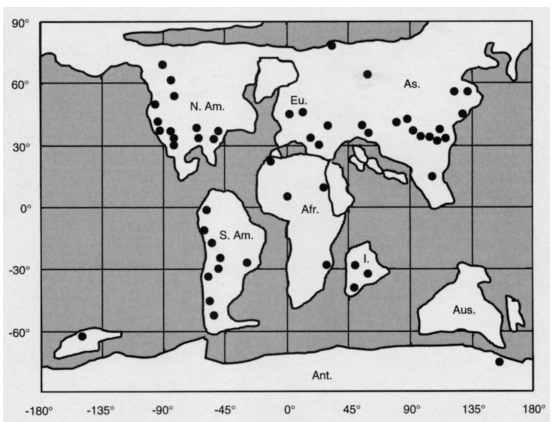

図２．

図１．後期三畳紀における現在の大陸の配置．地球はパンゲアと呼ばれる一つの大陸塊で占められている．①点は主要な化石が見つかる地点を示す。②多くの恐竜の化石が，これらの化石産地で見つかっている。Afr.，アフリカ；Ant.，南極；As.，アジア；Aus.，オーストラリア；Eu.，ヨーロッパ；N. Am.，北アメリカ；I.，インド；S. Am.，南アメリカ。

図２．③後期白亜紀における現在の大陸の配置（パンゲアの分裂の開始は，前期ジュラ紀に生じた）。大陸の配置は現在とあまり変わらない。④ヨーロッパの多島海はもちろん，アジアと北アメリカの間の陸橋にも注目。⑤略語については，図１の凡例を見なさい。

恐竜（dinosaurs），パンゲア(Pangaea)，多島海(archipelago)

The Evolution and Extinction of the Dinosaurs, David E. Fastovzky et al. (Cambridge University Press)を引用および参照。

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解答用紙（英語）（平成 21 年 1 月 22 日）

受験番号

氏名

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