A. 閱讀能力測驗：每一題僅有一個正確或最佳答案；請於答案卷作答 (每題 4 分，共 40 分)。

(1). Answer questions 1-5 according to the abstract of the following article:

Huber, M. and Knutti, R., 2011. Nature Geoscience, vol. 5, 31-36.

The Earth's energy balance is key to understanding climate and climate variations that are caused by natural and anthropogenic changes in the atmospheric composition. Despite abundant observational evidence for changes in the energy balance over the past decades, the formal detection of climate warming and its attribution to human influence has so far relied mostly on the difference between spatio-temporal warming patterns of natural and anthropogenic origin. Here we present an alternative attribution method that relies on the principle of conservation of energy, without assumptions about spatial warming patterns. Based on a massive ensemble of simulations with an intermediate-complexity climate model we demonstrate that known changes in the global energy balance and in radiative forcing tightly constrain the magnitude of anthropogenic warming. We find that since the mid-twentieth century, greenhouse gases contributed 0.85 °C of warming (5–95% uncertainty: 0.6–1.1 °C), about half of which was offset by the cooling effects of aerosols, with a total observed change in global temperature of about 0.56 °C. The observed trends are extremely unlikely (<5%) to be caused by internal variability, even if current models were found to strongly underestimate it. Our method is complementary to optimal fingerprinting attribution and produces fully consistent results, thus suggesting an even higher confidence that human-induced causes dominate the observed warming.

1. According to the passage, the best way to understand climate is to study what? (A) Natural and anthropogenic changes. (B) Spatial warming patterns. (C) The Earth's energy balance. (D) Climate variations.
2. What method is unlikely to be used in the research? (A) Climate simulation. (B) Statistical analysis. (C) Model computation. (D) Filed trip.
3. What is the best title for this article? (A) Anthropogenic and natural warming inferred from changes in Earth's energy balance. (B) The signal of ocean global warming. (C) Greenhouse-gas emission targets for global warming. (D) The detection and attribution of climate change.
4. About half of the earth can be neutralized by what? (A) Carbon dioxide. (B) Aerosols. (C) Organic carbon. (D) Radiative forcings.
5. Which forcing contributes the most to global temperature change? (A) Natural forcing. (B) Greenhouse gases. (C) anthropogenic forcing. (D) Aerosols.

(2). Answer questions 6-10 according to the abstract of the following article:

Emanuel, K., 2005. Nature 436, 686-688.

Theory and modelling predict that hurricane intensity should increase with increasing global mean temperatures, but work on the detection of trends in hurricane activity has focused mostly on their frequency and shows no trend. Here I define an index of the potential destructiveness of hurricanes based on the total dissipation of power, integrated over the lifetime of the cyclone, and show that this index has increased markedly since the mid-1970s. This trend is due to both longer storm lifetimes and greater storm intensities. I find that the record of net hurricane power dissipation is highly correlated with tropical sea

surface temperature, reflecting well-documented climate signals, including multidecadal oscillations in the North Atlantic and North Pacific, and global warming. My results suggest that future warming may lead to an upward trend in tropical cyclone destructive potential, and—taking into account an increasing coastal population—a substantial increase in hurricane-related losses in the twentyfirst century.

6. Which terminology belongs to a different category? (A) Typhoon. (B) Cyclone. (C) Hurricane. (D) Anticyclone.
7. What factor will probably not strengthen the storm intensity? (A) Rising sea surface temperature. (B) Dissipation of hurricane power. (C) Seawater pollution. (D) Global warming.
8. According to the article, which factor may also contribute to the destructive force of tropical cyclones? (A) Human activities. (B) Hurricanes. (C) Earthquakes. (D) Increasing coastal population.
9. What is the best title for this article? (A) The side effect of global warming. (B) The strongest Atlantic tropical cyclones in history. (C) Increasing destructiveness of tropical cyclones over the past 30 years. (D) Ways to observe tropical cyclones.
10. What time scale is the most appropriate to the author's study? (A) Centurial. (B) Seasonal. (C) Annual. (D) Millennial.

B. 基本字彙測驗：寫出下列各英文名詞的中文(每題 3 分，共 15 分)。
1. Greenhouse effect   2. Thermocline   3. El Nino   4. Tsunami   5. Carbon cycle

C. 基本字彙測驗：寫出下列各中文名詞的英文 (每題 3 分，共 15 分)。
1. 中洋脊   2. 貧營養鹽   3. 混合作用   4. 陸源物質   5. 間冰期

D. 英文表達測驗：將下列段落文字以大意 (非逐字) 方式翻寫成英文，評分以文法和拼字的正確及文句通順程度為標準 (每題 15 分，共 30 分)。
1. 在去年世界的人口已經超過了 70 億；同時由於科技的發達；許多開發中國家的生活標準逐漸達到富裕的程度；這種種的因素對於地球的自然資源和生態環境均造成了重大的壓力。
2. 全球暖化到底是人類所導致的，還是自然的變化，不同領域的科學家有不同的看法。古海洋和古環境學家認為是地球系統的自然變化，但是大氣、水文、海洋學家則認為主要是因人類活動而造成的。