

※ 考生請注意：本試題不可使用計算機

A. 中翻英。把握文意重點，不需逐字翻譯。專有名詞、地名、人名等，無常用的中文翻譯時，可使用原文。以下段落摘自：

Campbell, J. B., and Wynne, R. H., 2011. *Introduction to remote sensing*, 5th edition.

El-Rabbany, A., 2006. *Introduction to GPS: the Global Positioning System*, 2nd edition.

Delaney, J., 2007. *Geographical information systems: an introduction*, 2nd edition.

1. (10 分) The Murray River plays a vital role in southern-eastern Australia, supplying water to towns, the irrigation industry, and the flora and fauna of the floodplain. Over time the river has been regulated for human use. Floods have thus become more infrequent and of smaller magnitude, leaving the vegetation communities of the floodplain highly stressed. Combined with likely climate change impacts, the vegetation health along the river will probably continue to decline into the future without intervention. Consequently, scientists at the institute of CSIRO Land and Water are intending to model water flow and depth across the Murray River floodplain. The expectation is that a greater understanding of how the floodplain works will help river managers supply the native vegetation with flooding of sufficient magnitude and frequency to ensure its survival. A very detailed digital elevation model (DEM) of the floodplain is required to assist this modeling.
2. (10 分) Since the early 1920s acoustics have been used to measure the depth beneath a vessel. These single beam sounders have been widely used to map the seafloor for the purpose of navigation safety. Such systems transmitted a pulse of sound vertically down to the seafloor, where it was reflected back to the ship. The two-way travel time from transmit to receive was recorded, and a depth computed using a speed of sound through seawater scale factor.
3. (10 分) The ability of DGPS to provide real-time submeter- or even decimeter-level accuracy has revolutionized the agricultural industry. GPS applications in precision farming include soil sample collection, chemical applications controls, and harvest yield monitors. When collecting soil samples, GPS is used to precisely locate the sample points from a predefined grid. After testing the soil samples, information such as nitrogen and organic material content can be obtained. This type of information is mapped and used as a reference to guide farmers to efficiently and economically treat soil problems.
4. (10 分) Since its early development, GPS has been used successfully in monitoring the stability of structures, an application that requires the highest possible accuracy. Typical examples include monitoring the deformation of dams, bridges, and television towers. Monitoring ground subsidence of oil fields and mining area are other examples where GPS has been used successfully. In some cases, GPS may be supplemented by other systems such as INS or total stations to work more efficiently. Deformation monitoring is done by taking GPS measurements over the same area at different time intervals.

(背面仍有題目，請繼續作答)

系所組別：測量及空間資訊學系

考試科目：科技英文

考試日期：0223，節次：1

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5. (10 分) Carbon (C) in its varied forms is one of the essential components of living organisms and is of key interest in any consideration of global cycling within the biosphere. Carbon is available for living organisms as carbon dioxide ( $CO_2$ ) and as organic carbon (plant and animal tissues), sometimes known as fixed carbon, because it is much less mobile than  $CO_2$ ; within organisms respiration can convert organic carbon to its gaseous form.
6. (10 分) The advanced very-high-resolution radiometer (AVHRR) is a multispectral radiometer carried by a series of meteorological satellites operated by NOAA in near-polar, sun-synchronous orbits. They can acquire imagery over a swath width of approximately 2400 km. AVHRR acquires global coverage on a daily basis; the frequent global coverage is possible because of the wide angular field of view, but areas recorded near the edges of images suffer from severe geometric and angular effects. As a result, AVHRR data selected from the regions near the nadir provide the most accurate information. Although designed initially for much narrower purposes, AVHRR is the first sensor to provide the basis for collection of worldwide datasets that permit assessment of environmental issues.

## 參考翻譯名詞

vital 重要

irrigation 灌溉

flora 植物群

fauna 動物區系

native 本土的

decimeter 公寸

yield 產量

deformation 形變

subsidence 沉降

supplement 補充

component 組件

tissue 組織

meteorological 氣象的

## B. 短文寫作

(40 分) Write a short essay of 300 – 500 words regarding the courses (can be one or many) that you have taken in the field of Geomatics and how these courses inspired you to continue on the graduate study. If you have not taken any Geomatics related course, write about your past experiences and how these experiences inspired you to pursue the graduate degree in this new field.